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Improving Deployment-Related Primary Care Provider Assessments of PTSD and Mental Health Conditions

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14. ABSTRACT

Progress in completing planned Year 1 SOW activities has been delayed due to several factors, including: (1) delays in completing an agreed upon data use agreement for data required by Vanderbilt and Purdue to complete analyses relevant to the training and feedback intervention design; and (2) the 2010 NDAA Sec. 708 levied additional requirements that were not anticipated at the outset of the study, which directly impacted the study design. Despite these delays, substantial work has been completed in literature review, in psychometric analysis of materials to be used in the study, in staffing and approval processes completed, in completion of data use agreements with the Army, Navy, and Air Force, in formation and receipt of guidance by the Expert Panel, and in development of a strong working relationship among FHP&R, Vanderbilt, and Purdue. Year 2 is expected to be highly productive. Early in Year 2, it is expected that data will be received and the training and feedback intervention design will be finalized. Implementation of the pilot is expected by May, 2011 with data collection to continue for four months. This will be followed by analysis and manuscript preparation. Vanderbilt expects these activities to extend beyond the current period of performance and plans to request a one-year extension to allow adequate time to complete the SOW.

15. SUBJECT TERMS
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INTRODUCTION

This project addresses the need for research on service delivery approaches for Service Members (SMs) with combat-related physical or psychiatric symptoms, including Posttraumatic Stress Disorder and/or post-concussive symptoms. As a primary care encounter, the post deployment health reassessment (PDHRA) process is critical to force health protection efforts. The project will develop and test the effectiveness of a targeted training and feedback intervention designed to help providers increase SM reports of behavioral health concerns and SM acceptance of a referral for further assessment. The project builds on a previous evaluation of the PDHRA process, a collaborative effort between Vanderbilt University and Force Health Protection and Readiness, and will be applicable to all Service Branches and Components. This evaluation was contracted to Vanderbilt University with the final report available on Defense Technical Information Center (DTIC) at http://handle.dtic.mil/100.2/ADA528063.

The project has two aims. (Aim 1) Development of PDHRA-specific clinical guidelines and training materials through collaboration with key national leaders and installation-level stakeholders involved in the PDHRA process, and through a secondary analysis of PDHRA data linked by provider. (Aim 2) Test of intervention effectiveness at four to six sites with 39 primary care providers who conduct PDHRAs. Providers will be randomly assigned to one of two interventions (training and ongoing feedback or training only) or to typical training (control group). Outcomes include implementation fidelity and quality, content analysis of communication style from interview audiotapes, secondary analysis of the PDHRA form and SM health care utilization, and SM satisfaction surveys. Data will be analyzed using a longitudinal repeated measure slope-as-outcome model. A secondary analysis of PDHRA data will also be conducted to identify risk factors in the development of Posttraumatic Stress Disorder. The project is a cooperative effort among Vanderbilt University, Force Health Protection and Readiness (FHP&R), and Purdue University. The project period of performance is 30-SEP-09 to 31-OCT-11. This report summarizes Year One (30-SEP-09 to 29-SEP-10) progress on scope of work (SOW) activities, key research accomplishments, and reportable outcomes. We conclude by summarizing results to date and projecting work to be accomplished through the remainder of the project.

BODY OF REPORT

Vanderbilt University Scope of Work (SOW) Tasks

Task 1. Timing of Approvals and IRB (Y1, M1-11)

Overview

Task 1 activities are oriented to ensuring that all proper approvals and IRB activities are completed in a timely manner, so that the provider intervention and other research activities can proceed according to schedule. The subtasks for Year 1 listed under Task 1 in the SOW are as follows:

- 1a. Multi-project Institutional Authorization Agreement (IAA) submitted to TMA Exempt Determination Official to establish the VU IRB as the IRB of record (Y1, M1-2)
- 1b. PHDRA secondary analysis protocol (Year 1, M1-4)
    - Submitted to VU IRB, estimated review time for non-human subjects protocol (Y1, M1)
    - Submitted to TMA Exempt Determination Official, estimated review time (Y1, M3-4)
- 1c. PDHRA focus group protocol (Y1, M1-4)
    - Submitted to VU IRB, estimated review time for exempt protocol (Y1, M1-2)
    - Submitted to appropriate Army IRBs and estimated review time (Y1, M3-4)
- 1d. Training & feedback intervention study protocol (Y1, M3-10)
    - Submitted to VU IRB, estimated review time for expedited protocol (Y1, M3-4)
    - Submitted to appropriate Army IRBs, estimated review time (Y1, M5-11). Note that final training materials will be submitted for review in months 10-11.

Status

With the exception of the training and feedback intervention study protocol, we have obtained necessary approvals from the Army Medical Research and Materiel Command (MRMC) and Vanderbilt University's Institutional Review Board (IRB).

The Vanderbilt research team submitted a non-human subject application for secondary analysis (Task 1b) to Vanderbilt's IRB on 12-DEC-09 and received approval on 30-DEC-09. A second human subjects application, specifying access to provider and location ID was submitted to the VU IRB for expedited review on 12-APR-10 and notification of approval was received on 17-MAY-10. The VU IRB approval and protocol were submitted to Army Medical Research and Materiel Command (MRMC) on 17-MAY-10 and was approved by MRMC on 24-MAY-10.

Problems and Circumstances that Necessitated Changes to Task

Task 1a was not completed since it was determined through conversations between Vanderbilt and MRMC that no IAA was necessary for this project.

The PDHRA focus group protocol (Task 1c) was not submitted due to mutual agreement between FHP&R and Vanderbilt not to use the focus group methodology at installations in Year 1 (see Task 2 for more information).

The training and feedback intervention study protocol (Task 1d) has not yet been submitted due to circumstances described further in Task 4.

Outcomes and Next Steps

As detailed in Task 4, the training and feedback intervention study protocol (Task 1d) is in development. We anticipate that it will be submitted to Vanderbilt's IRB early in Year 2. As we continue to review installations for potential participation in the study, we will collaborate with FHP&R to plan the PDHRA provider focus groups (Task 1c) or determine an appropriate alternative after receiving approval from the Army GOR.

Task 2 (Aim 1). PDHRA Focus Groups (Y1, M1-2, 5-9)

Overview

The stated goal of Task 2 was to conduct focus groups of key stakeholders involved in the PDHRA process, and to analyze the resultant data with the intention of identifying key elements for training interventions relevant to content, format, and implementation. The subtasks for Year 1 listed under Task 2 in the SOW are included below:

- 2a. Recruitment of four to six study sites (Y1, M1-2)
- 2b. Development of focus group protocols (Y1, M1)
- 2c. Administration of 2-hour focus groups conducted at each study site (Y1, M5-7)
- 2d. Professional transcription of focus group audiotapes ongoing as each completed (Y1, M5-7)
- 2e. Qualitative analysis will be ongoing as each focus group completed with aggregation of findings after all completed (Y1, M5-9)
- 2f. Production of preliminary reports and briefings (Y1, M8-9).

Status

Task 2 was not completed as proposed due to significant legislation that was introduced relevant to this project between the time of the original proposal and the start of work. In planning meetings and emails (primarily in March, 2010) FHP&R and Vanderbilt agreed not to conduct the focus groups pending DoD efforts related to the legislation. In the interim, Vanderbilt research team members conducted a total of seven informal telephone interviews

with representatives from five military installations between 20-APR-10 and 30-APR-10. The five installations were chosen on the basis of previous contact during the evaluation of the PDHRA process conducted by Vanderbilt prior to this project. Installation representatives included medical officers and/or administrators involved in the PDHRA process at each installation. This was a planning activity similar to the gathering of Expert Panel perspectives rather than a research activity designed to gather externally reportable data.

Problems and Circumstances that Necessitated Changes to Task

H.R. 2647: National Defense Authorization Act for Fiscal Year 2010 became Public Law 111-84 on 28-OCT-10. Section 708 (hereinafter referred to as NDAA Sec. 708) of the act directly affected how the PDHRA process would be conducted across Services and Components. In brief, the legislation requires pre- and post-deployment mental health assessments and training for the providers conducting the assessments. As a result, FHP&R led efforts throughout 2010 to modify the current mental health risk assessments relevant to deployment screening, develop the associated policy, and develop the training content and procedures. On 04-AUG-10, the NDAA Sec. 708 policy document became available and was sent to Vanderbilt by FHP&R, although the actual training content still remained under development. On 27-AUG-10, the modified assessments and training content became available for public viewing in the form of a set of PowerPoint slides posted on FHP&R's web site (http://fhpr.osd.mil/pdfs/NDAA%20FHP_DHCC.pdf). As can be seen in the slides, the self-report portion of the PDHRA includes the same behavioral health questions as before, now called the Stage One screening. For SMs who meet scoring criteria on Stage One screening, additional detailed Stage Two screenings will be administered. The slides also present the training content for health care providers, including information on the screening tools, basic procedures for scoring and administration, suggestions for follow-up questions in cases of concern, suggestions for improving communication and interview style, and additional resources for further information. As of this writing, FHP&R is in the process of developing a video to accompany the slides as part of the training procedures. Note that Service Branches and Components are still in the process of finalizing their plans for implementing the NDAA Sec. 708 with few details available at this time on how the modifications will be incorporated into existing PDHRA processes at the site level. According to FHP&R, implementation of the modified assessments and provider training is scheduled to begin in Spring 2011.

Outcomes and Next Steps

Given that the implementation plans relevant to the modified assessments and provider training are still pending from the Services, it is as yet to be determined when would be an appropriate time to conduct the focus groups as planned. As we continue to review installations for potential participation in the study, we will collaborate with FHP&R to plan the

PDHRA provider focus groups (Task 1c) or determine an appropriate alternative after receiving approval from the Army GOR.

The informal telephone interviews have substantially informed the intervention design process, thus the information gathered during these calls will be summarized here. The Vanderbilt team gathered information in seven major areas: Provider training and quality assurance; Staff Meetings; Service Member Education; Ideas on Potentially Useful Feedback for Providers; Factors Influencing Success or Failure of the PDHRA Process; and Willingness to Participate in a Study. The goals associated with each area are listed below, along with brief summaries of the telephone interviews.

1. **Provider Training**
   Goal: To learn how providers at the installations were trained, in order to better understand the pre-intervention state of each location, and also to explore the extent to which the "pre-intervention" state was uniform across installations.

   Findings: Training of PDHRA providers was found to be minimal, which was consistent with our findings in the previous evaluation. At all installations except for one, new providers shadowed an experienced provider for one to two days. Shadowing occurred for up to two months at the remaining installation, but this was due more to delays in getting necessary passwords than it was to a planned training time extension. Most sites also reported including a one-time training on policies and data entry (for example, training with MEDPROS or receipt of PowerPoint slides that detail guidelines and policies relevant to the PDHRA). One site conducted additional training via monthly grand rounds, and providers at one other site received supplemental suicide prevention training and training from a psychiatric nurse.

2. **Quality Assurance**
   Goal: To determine how installations conduct quality assurance activities (if any) in the pre-intervention state and identify procedures already in place that could integrate well with the provision of feedback through our study intervention.

   Findings: Evaluation procedures varied, including quarterly peer review and performance review (one installation), monthly evaluation (one installation), and annual review with semi-annual updates (one installation). Formal review did not exist at the remaining two installations. Performance review was generally not specific to the PDHRA process, but rather encompassed multiple activities at the installation.

3. **Staff Meetings**
   Goal: To learn how often staff meetings were held and what type of content they generally included. The study intervention will include regular meetings to provide feedback to clinical and administrative staff associated with the PDHRA process, which we hope to integrate into existing installation processes so as to cause a minimum amount of disruption and increased time constraints.

Findings: The frequency of staff meetings was variable. They occurred quarterly at one installation, monthly at another (in the form of grand rounds), weekly at two installations, and only as needed at the remaining site. At all installations except the one which employed a grand rounds format, typical topics included review of procedure changes rather than clinical issues or didactic content associated with effective strategies for performing the PDHRA interview.

4. **Service Member Education**
   Goal: To learn about any formal procedures for providing education to Service Members that existed at each installation, in order to better understand the pre-intervention state at these locations.

   Findings: Interviewees from all installations viewed the provision of education to Service Members as a role for providers, but most locations filled this need outside of the interview with presentations like Battlemind II or post-deployment briefings. Brochures and handouts were generally available for providers to give to SMs during interviews. When the interviewee happened to be a provider who conducted PDHRA screenings, he or she tended to note at least one personally preferred strategy for identifying Service Members who could benefit from education during the interview. For example, one provider said he always gave out information to SMs on the cusp of a problem, and another said he always made sure that SMs who seemed to be trying to rush the interview left with information on how to make an appointment if they needed one. However, no installation mentioned any formal training mechanisms to help providers better communicate educational information to Service Members, and three specifically stated that no such education existed at all.

5. **Ideas on Potentially Useful Feedback**
   Goal: To learn what forms of feedback would be considered useful to key stakeholders at installations.

   Findings: Possible types of feedback for providers fell into several categories, which are detailed below:

   a. Deployment and Combat Experiences—All interviewees stated that information about deployment conditions and number of deployments would be useful, as would more knowledge of actual experiences and injuries. One interviewee noted that the system is concerned only with problems related to the most recent deployment, but that this is not in line with the SM's perspective, in which all deployments run together, and symptoms related to one deployment may continue or reappear following subsequent deployments.
   b. SM Satisfaction—Installation representatives were divided on the usefulness of this potential category of feedback. One interviewee saw it as potentially very important for use in identifying and fixing problems. Other installations were unsure about the extent to which it would help, with one site representative noting that he personally thought it could be important, but was unsure of how

interested providers would be given that they are more concerned with the straightforward medical side of the process rather than with the communication side.

c. Feedback about Referrals—This could include either individual or aggregate data relating to numbers and types of referrals as well as information on whether referrals were kept. In general, interviewees saw follow-up of individual SMs who had been referred as a job for someone other than the PDHRA provider. For the most part, the installations we contacted appeared not to have explored the possibility of using information on past referrals to identify ways of improving future appropriate referral rates. However, one interviewee did note that clinic providers sometimes call to report inappropriate referrals, and the interviewee indicated that it might be helpful to formalize this process somehow.
d. Instruction on how to use the PDHRA Form—More instruction on how to best use the PDHRA form (for example, guidance on interpreting self-reported information) was seen as potentially useful by interviewees from two sites, though concern was noted about the need to do this in such a way that providers were not treated like robots. One interviewee mentioned that providers were very oriented towards sticking to the form, and that a strategy that would be more useful than training providers to ask more questions would be to simply add these questions to the form.

6. Factors Influencing Success or Failure of the PDHRA Process

Goal: To determine factors that key personnel at each installation considered to be essential for the success of the PDHRA process.

Findings: All interviewees had some specific ideas on factors that could influence the effectiveness of the PDHRA process. A summary of these considerations is listed below:

a. The site's ability to facilitate referrals was listed as key by two sites. One commonly cited factor in referral facilitation was the practice of having psych techs or other mental health professionals available so that the referral could take place immediately once it had been made. All but one site already had this latter structure in place. This ability to facilitate referrals was also seen as demonstrating to SMs that they would get the care they needed.
b. Two sites emphasized the importance of having providers who were retired military or at least knowledgeable about the military. This background was seen as helpful in recognizing problems and in knowing what to expect during the interview.
c. One site noted that it would be helpful if the PDHRA were moved to a more clinical setting so that SMs would spend less time waiting in line, and there would be less combination of the PDHRA with vaccinations and other medical readiness procedures.
d. One interviewee stated a belief that more automation of the system would positively influence success. She thought that having SMs complete a more

extensive online screening with validated instruments would provide a better (direct) conduit to treatment than using the current PDHRA form and interview for screening. This interviewee also thought that, failing this, it was important to get all of the relevant symptoms and information to the providers ahead of time.

e. One site already had a process in place by which it received information about deployment and specific medical problems from the unit medic before the unit returned. This was seen as a factor influencing success of the process.

7. **Willingness to participate in Study**
   Goal: To assess willingness to participate in an intervention during Year 2 of the project and to determine whether representatives were also willing to be contacted to give further input during intervention development.

   Findings: All interviewees were willing to be contacted with further questions in the future, and all expressed potential interest in participating in the proposed study.

Task 3 (Aim 1). PDHRA Secondary Analysis (Y1, M4-9)

Overview

The stated goal of Task 3 was to conduct an extensive, robust secondary analysis of the PDHRA data obtained during Vanderbilt's previous DoD-funded evaluation of the PDHRA process, with a focus on identifying provider factors that contribute to elicitation of candid SM reporting of behavioral health concerns and to SM acceptance of associated referrals for further evaluation or treatment. The resulting information would be utilized in the development of the training and feedback intervention. The subtasks for Year 1 listed under Task 3 in the SOW are included below:

- 3a. Data requests to appropriate information technology officer at each Service for provider and MTF identifiers for PDHRAs completed between 01-JAN-06 to 31-MAY-09 (Y1, M4)
- 3b. Linking file created by TMA to provide de-identified dataset to VU containing non-identifying SM identifier and provider/MTF identifiers (Y1, M4-8)
- 3c. Data management and analysis (Y1, M5-7). Abbreviated analytic timeframe estimated because we will be adding this dataset to existing clean datasets with much of the analytic programming developed.
- 3d. Production of preliminary reports and briefings (Y1, M8-9).

Status

Data Use Agreements (DUAs) for Vanderbilt to receive provider and MTF identifiers for PDHRAs completed between 01-JAN-06 and 31-MAY-09 were signed and in place with all Services ahead of schedule (Task 3a). The Air Force DUA was signed by all parties on 4-MAR-10, the Army DUA on 7-APR-10, and the Navy DUA on 20-APR-10.

To date no data have been received by Vanderbilt; thus tasks 3b, 3c, and 3d remain incomplete. Vanderbilt took the opportunity to conduct additional psychometric analyses on SM survey data originally collected as part of the previous PDHRA evaluation. The goal of these analyses was to further refine the SM survey for use during the current study.

Problems and Circumstances that Necessitated Changes to Task

We clarified that data were to be received from Armed Forces Health Surveillance Center (AFHSC) and not TMA. A DUA was signed by all parties on 14-JAN-10; however, this DUA was later rescinded by AFHSC on 29-APR-10 because it did not contain language giving AFHSC authority to edit and approve any presentations or publications resulting from the study. In addition the original DUA was not valid as it was not signed by the appropriate approval authority at Vanderbilt. A new AFHSC DUA was provided to Vanderbilt on 21-JUN-10. This DUA contained language giving AFHSC authority to edit and approve any presentations or publications resulting from the study. This language was found to be unacceptably restrictive by Vanderbilt's Division of Sponsored Research (DSR), the official signing body for Vanderbilt. After several weeks of negotiation among FHP&R, AFHSC, the Vanderbilt research team, and the Vanderbilt DSR it was determined that the only way to achieve resolution of the AFHSC DUA issue was for the Vanderbilt research team to request and receive a Waiver of University Information Dissemination Policy from the Vice Provost of Vanderbilt University. It must be emphasized that this was an extreme measure, and that such waivers are only very rarely granted by the University. In this case, the waiver was approved on 29-SEP-10. It is expected that the DUA will be signed early in Year 2 and data received within six weeks of provision of the signed DUA to AFHSC. Data management, analysis, and production of preliminary reports and briefings will subsequently follow in Year 2.

Outcomes and Next Steps

Vanderbilt currently awaits the data for secondary analyses, and will carry out the activities originally scheduled to take place during Year 1 upon their receipt.

The results of the psychometric analyses using the existing data from the SM survey are presented in Appendix A. The survey had been previously administered to 6,714 SMs to gather information on SM satisfaction with and attitudes relevant to the PDHRA process. Nine scales

had been formed on the basis of theory review and found to be reliable. The data were re-analyzed using exploratory factor analysis, resulting in seven scales. As the training and feedback intervention and accompanying research design are finalized early in Year 2, the SM survey with new scales will be finalized. It is likely that additional items may be included after the design is finalized.

Task 4 (Aim 2). Training and Feedback Intervention Effectiveness Study (Y1, M1-9)

Overview

The activities listed under Task 4 address the central goal of Vanderbilt's research, which is to develop and test the effectiveness of a targeted training and feedback intervention designed to help providers increase Service Member reports of behavioral health concerns and Service Member acceptance of referrals for further assessment. The subtasks for Year 1 listed under Task 4 in the SOW are as follows:

- 4a. Recruitment of four to six study sites (Y1, M1-2)
- 4b. Development of training materials (Yr 1, M1-9)
- 4c. Randomization of 39 providers across four to six study sites (Y1, M12)
- 4d. Collection of pre-training audiotapes from 39 providers, consisting of one randomly selected hour of PDHRA interviews (Y1, M12)

Status

As stated previously in Task 2, the five installations contacted in the course of gathering information from key stakeholders in the PDHRA process all expressed interest in potentially participating in the study. Because the training and feedback intervention must occur at installations with sufficient throughput of SMs participating in PDHRA screening, FHP&R contacted the Army for deployment schedule information through March of 2011 (the PDHRA is typically scheduled for three to six months post-deployment). This information was received by FHP&R in September 2010. FHP&R communicated to Vanderbilt that the five potential installations would have sufficient throughput through March 2011. At this time, no study sites have been formally recruited. Thus no randomization of providers or data collection has occurred.

The development of the provider training and feedback intervention is in progress but not yet complete due to delays described further below.

Problems and Circumstances that Necessitated Changes to Task

Three areas of concern contributed to delays in the study design: (1) lack of completion of an agreed upon DUA to obtain the data for secondary analysis; (2) the 2010 NDAA Sec. 708 levied additional requirements that were not anticipated at the outset of the study, which directly impacted the study design; and (3) logistic concerns on the feasibility of a data-based feedback and decision-support system based on use of PDHRA as the data source. These three issues and Vanderbilt's related progress in intervention design are summarized below.

First, the primary activity during Year 1 was intended to be an extensive secondary analysis of the data collected during Vanderbilt's previous evaluation of the PDHRA process (see Task 3). By adding variables to account for clustering of SMs within providers within installations, this analysis would inform the development of an evidence-based training and feedback intervention by identifying areas of variability in concerns and referrals attributed to the provider, over and above SM self-reported problems. The secondary analysis by Vanderbilt in addition to new VA data analyzed by Purdue was also intended to form the basis of the actuarial modeling approach described in the original proposal that was awarded. Since no data have yet been received, Vanderbilt conducted a review of the literature on relevant strategies to enhance provider communication and decision making (included as Appendix B). This literature review summarized studies that have evaluated the effectiveness of several types of interventions to improve provider behavior, including training on communication strategies to enhance elicitation of patient problems and compliance with medical regimen; feedback on clinically relevant and actionable information related to the PDHRA process; and quality indicators of strategies for decision support to health care providers. The section on feedback focused on studies of published validity and utilization of the behavioral health subscales contained in the PDHRA for identifying behavioral problems in screening populations.

In addition, Vanderbilt focused efforts on reviewing our previous evaluation report for information relevant to enhancing PDHRA provider reliability (i.e., decreasing variability in provider reporting of concerns and referral recommendations for SMs with similar problems) and sensitivity (i.e., increasing elicitation of SM concerns and problems when present). The previous evaluation findings were presented to FHP&R staff and others at an in-person meeting on 14-JAN-10. A second teleconference meeting was held on 03-MAR-10 with staff from FHP&R and Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE) for the purpose of communication information relevant to intervention design. The slide presentation from 03-MAR-10 meeting is included as Appendix C.

Second, the NDAA Sec. 708 legislation previously described (see Task 2) significantly influenced our progress in designing the training and feedback intervention. Until August 2010, comprehensive details of the policy and associated materials were unavailable to us, as they

were in development. This contributed to concerns that any training activities developed as part of this project could potentially be redundant or even contradictory to the NDAA Sec. 708 policy, which would negatively impact not only the pilot but also utilization of any findings for future implementation after project completion. Therefore, in March 2010, FHP&R and Vanderbilt agreed to focus Year 1 efforts on the feedback aspects of the intervention. Vanderbilt developed an initial intervention design focusing on two types of information that could enhance provider behavior: decision-support incorporating actuarial modeling approaches that could be used by providers with individual SMs, and aggregated weekly feedback on primary PDHRA outcomes that could be used for quality improvement purposes. The design was presented to FHP&R and approved prior to a presentation to the Expert Panel on 21-JUN-10. A description of the preliminary intervention design including examples is available in the presentation slides in Appendix D. Examples contained in the slides provide mock-ups using a computer-based system and pen-and-paper protocols.

Third, the initial intervention design was predicated on the use of PDHRA data as the source for the data-based feedback and decision-support system. This would require frequent downloads of PDHRA data and a complex de-identification/re-identification procedure (for use by Vanderbilt in creating the feedback and decision-support for providers). Although the feasibility of using PDHRA data was yet to be determined, with concerns raised by FHP&R in March 2010, both Vanderbilt and FHP&R agreed to explore the possibility with intervention development ensuing over the next several months. In early September 2010 FHP&R asked Vanderbilt to reconsider the intervention design, which was considered too resource intensive because of information technology (IT) limitations, including the need for weekly involvement of AFHSC for downloading and de-/re-identifying PDHRA data. In addition, further discussions with FHP&R clarified feasibility concerns about the inclusion of the SM-specific decision-support and use of IT for delivery due to timeline and resource limitations. Also in September 2010 the policy and training materials for NDAA Sec. 708 had been made publicly available. FHP&R asked that Vanderbilt focus efforts on training related to provider communication and interview style as stated in the original proposal, stating this would be a valuable addition to the new NDAA Sec. 708 materials. At this time, Vanderbilt is in the process of revising the training and feedback intervention design. In addition to internal planning efforts, the Vanderbilt team has a scheduled in-person meeting with Sarah Mustillo from Purdue University for a day-long planning meeting.

Outcomes and Next Steps

It is anticipated that the research team will collaborate with FHP&R to develop the final plan early in Year 2 to be followed by the necessary approvals processes.

Given the delays experienced, it is anticipated that the intervention will be implemented in May, 2011 with data collection continuing for a period of four months. FHP&R will determine appropriateness of potential participating installations on the basis of throughput of SMs participating in PDHRA screenings through the period of May to August, 2011. FHP&R plans to formally request participation from the Army for formal site recruitment after the approvals processes are in place. Randomization of providers and pre-intervention data collection will occur prior to implementation of the intervention anticipated in May, 2011. As possible, pre-intervention data collection will occur prior to the implementation of the NDAA Sec. 708 activities at participating installations.

Task 5. Expert Panel Meetings (Y1, M2, 9)

Overview

The purpose of the Expert Panel meetings is to ensure that intervention development is fully informed by the needs and resources of all Service Branches and Components. The subtasks for Year 1 listed under Task 6 in the SOW are as follows:

- 5a. Four-hour in-person meeting in Washington DC (Y1, M1)
- 5b. Two-hour teleconference calls (Y1, M9).

Status

The Expert Panel was formed by FHP&R with suggestions for potential members provided by Vanderbilt. FHP&R contacted potential participants in the month of June resulting in a final panel of eight members by 23-JUN-10. A ninth member was added to the panel in August resulting in a final group of nine members representing expertise and leadership in areas relevant to the PDHRA process. The membership roster is included as Appendix E.

The first in-person Expert Panel meeting was held on 21-JUL-10. The meeting was scheduled for two hours, with an initial presentation of the training and feedback intervention design by Vanderbilt (see Appendix D previously referenced in Task 4) followed by open discussion. The goal of the meeting was to present options for intervention design and elicit members' thoughts and opinions to guide development. One member attended by telephone. Members who could not attend the meeting were provided with the presentation slides by email.

Two follow-up meetings were scheduled with one of the Expert Panel members, COL Engel who has developed a computerized information system called First Steps in support of the RESPECT-Mil program. RESPECT-Mil is a primary care model employed in select Army installations to improve the identification and management of behavioral health conditions. The goal of these meetings was to learn more about COL Engel's existing computerized information system and to further discuss the potential use of computerized decision support as part of the study

intervention for provision of feedback to providers. The two one-hour teleconference calls occurred on 26-AUG-10 (attended by Vanderbilt team, FHP&R, and COL Engel's group) and 17-SEP-10 (attended by Vanderbilt team and COL Engel's group).

A ninety minute teleconference call among FHP&R, the full Expert Panel, and Vanderbilt had initially been scheduled for 08-OCT-10, but was cancelled on 28-SEP-10 due to a joint FHP&R-Vanderbilt decision to conduct further work on the intervention design before asking the Expert Panel to devote time to the development process.

Problems and Circumstances that Necessitated Changes to Task

As described previously, the development of the training and feedback intervention design was delayed due to the need to better understand the implications of the NDAA Sec. 708 legislation. Thus, the formation of the Expert Panel did not commence until after an initial design had been developed by Vanderbilt and approved by FHP&R for presentation to the panel. Further modifications to the intervention and accompanying research design necessitated cancelling the 08-OCT-10 meeting (see Task 4 for more detail).

In addition, due to the busy schedules of the Expert Panel members, it was determined that shorter meetings (two instead of four hours) with break-out meetings scheduled as needed would improve participation.

Outcomes and Next Steps

The Expert Panel's response to the initial training and feedback intervention design was favorable, with strong agreement for the need to improve reliability of provider recommendations for referral resulting from the PDHRA. After Vanderbilt and FHP&R have completed the revisions to the intervention design, the next Expert Panel teleconference will be scheduled. It is anticipated to occur early in Year 2.

Task 6. Project Planning Meetings (Y1, All months)

Overview

The planning meetings outlined in Task 6 are to ensure that both the development of the intervention and the resolution of any problems that might arise could be dealt with in a collaborative fashion by Vanderbilt, FHP&R, and Purdue (Vanderbilt's subcontractor). The subtasks for Year 1 listed under Task 6 in the SOW are as follows:

- 6a. Weekly one-hour teleconference calls (Y1, all months).

- 6b. Three one-day intensive project meetings to be held at FHP&R in Washington, DC (Y1, M1, 5, 10).

Status

After FHP&R assigned the current project manager, LCDR Nicole Frazer, the weekly one-hour teleconference calls commenced in January, 2010. Calls were productive and generally completed as scheduled. MAJ Bonilla-Vasquez, the Grant Officer's Representative, attends meetings in addition to FHP&R, Purdue, and Vanderbilt staff. Additional teleconferences were scheduled as needed, with frequent email communication. A table of all external meetings (project planning meetings, Expert Panel meetings, and other assorted meetings) is included as Appendix F. In addition to these meetings the Vanderbilt research team meets internally at least once each week.

Two in-person intensive project meetings were held at FHP&R on 14-JAN-10 and 21-JUL-10. The first meeting served to introduce the team members to each other and begin mutual review of the previous evaluation findings relevant to the study development. The second meeting was a follow-up discussion after the Expert Panel meeting. An in-person meeting between the Vanderbilt research team and Sarah Mustillo of Purdue University (subcontract) has been scheduled for 30-SEP-10 at Vanderbilt. The goal of this meeting is to make revisions to the intervention and research design based on feedback from FHP&R that necessitated further modifications (see Task 4 for further detail).

Problems and Circumstances that Necessitated Changes to Task

Vanderbilt was not assigned a permanent project manager until January, 2010, which delayed the start of project planning meetings.

Outcomes and Next Steps

The weekly teleconferences have allowed Vanderbilt to receive frequent updates regarding important military and government factors influencing the design of the intervention, and have also provided a venue for ongoing collaboration. It is anticipated that project planning meetings will continue to be held as scheduled during Year 2.

Purdue University Scope of Work (SOW) Tasks

Task 1. Dataset creation and preparation at VHA and DoD (Y1, M1-4)

Overview

Personnel at FHP&R and VHA will collect existing data on target population. Purdue personnel will establish data collection procedures, coordinate data collection between those two sites, troubleshoot, and assist with technical consultation.

Status

We have obtained necessary approvals from MRMC, VHA, and VA. At the VA, we have applied for and received approval from the local R&D committee, the privacy board, and the local institution. At the National VHA level, we have submitted all necessary documents and Dr. Mayeda at the VA has been granted approval for the identifiable data. We have hired a data manager to complete the data download and create the dataset.

Problems and Circumstances that Necessitated Changes to Task

Because the approvals processes took substantially longer than expected on both the DoD and VHA ends, we have yet to coordinate collection of existing data between the two sites, as no data have been obtained yet from either the DoD or the VA.

Outcomes and Next Steps

Now that the approvals processes have been cleared, we will work with Vanderbilt for the FHP&R data and with the VA to obtain the VHA data. We will also work closely with FHP&R to coordinate the receipt of the linking file by the VA, so that they may assign the unique study identifier and remove actual ID numbers before sending to Purdue.

Task 2. Travel to DC and Indianapolis to consult on collection of existing data (Y1, M3-5)

Overview

Purdue personnel will travel as necessary to finalize what data are being obtained from existing records as well as help establish procedures for data management.

Status

Purdue personnel have participated in weekly phone calls with DoD and Vanderbilt personnel and have met by phone as needed with VA staff in Indianapolis.

Problems and Circumstances that Necessitated Changes to Task

Because the approvals were not yet in place at either the DoD or the VA/VHA, no physical travel was necessary.

Outcomes and Next Steps

Now that the approvals processes have been cleared, we will arrange an in-person meeting in Indianapolis to finalize what variables are being obtained from the medical records data.

Task 3. Obtain data from FHP&R and VA and create dataset (Y1, M4-8)

Overview

Purdue personnel will obtain the data from both the VA and the DoD and create a dataset for the project. They will clean, recode, merge, and reshape data as necessary to prepare for analyses.

Status

No dataset preparations have occurred, but Mustillo did participate in a workshop on downloading and managing the VHA data given by VHA staff. Mustillo has had several phone meetings with VHA staff to discuss data and data management.

Problems and Circumstances that Necessitated Changes to Task

Because the data have yet to be received by Purdue, we were unable to complete any data management tasks. Instead, Purdue completed a literature review about PTSD in military Service Members (Appendix G) to determine the current state of knowledge and pressing issues. We focused the literature review on two major issues: a) reviewing studies estimating incidence and prevalence to determine what accounts for differences in rates across studies (e.g., samples, definitions, screening tools, timeframe, etc.) and b) reviewing studies that examine Service-level, family/community-level, and individual-level risk and protective factors for PTSD. Each of these areas will help us frame our analyses and meet the specific aims of the project.

Outcomes and Next Steps

Now that the approvals processes have been cleared, Purdue expects to receive the data in the early part of Year 2 and will thus be able to complete this step at that time.

Task 4. Analyze data (Y1, M8-12)

Overview

Purdue personnel will analyze the merged data from FHP&R and VA/VHA according to the specific aims and the research questions outlined in the proposal.

Status

Because the data have not been received yet, no data analyses have been conducted.

Problems and Circumstances that Necessitated Changes to Task

Because the data have yet to be received by Purdue, we were unable to complete any data analyses.

Outcomes and Next Steps

Now that the approvals processes have been cleared, Purdue expects to receive the data in the early part of Year 2 and will thus be able to complete this step.

KEY RESEARCH ACCOMPLISHMENTS

- Approvals and IRB processes were completed for both Vanderbilt and Purdue, with the exception of the approvals for the intervention study itself (submission planned early in Year 2) and the focus groups (to be determined)
- Staff and protocols are in place at the VA for Purdue to begin receiving VA data.
- In lieu of focus groups, informal telephone interviews were held with key stakeholders involved with the PDHRA process at five military installations to further understand existing training and quality assurance procedures relevant to the design of the intervention. Focus groups will be scheduled during Year 2 or modified (with approval by Army GOR).
- The SM survey developed for the previous evaluation has been updated based on further psychometric analysis, including exploratory factor analysis and Cronbach's alpha.
- Relevant literature review has been conducted by both Vanderbilt and Purdue, which will improve our ability to meet the stated project aims.
- Significant progress has been made on the training and feedback intervention design despite delays, with a final design anticipated in early Year 2.
- The Expert Panel has been convened with nine members representing important areas of leadership and expertise relevant to the study. One meeting was held with the whole panel and additional break-out meetings occurred with individual members. Expert Panel meetings will continue to be held in Year 2 to provide guidance and logistic support to the project as it continues.
- With the exception of the fourth quarter of 2009, project planning meetings were held as scheduled after the permanent project manager was assigned by FHP&R. Meetings will continue to be held as scheduled during Year 2

REPORTABLE OUTCOMES

To date one conference presentation has been conducted, with additional manuscripts for presentation and publication being planned. The presentation slides are included as Appendix H. The presentation informed the audience about the findings of the previous evaluation conducted by Vanderbilt, highlighting the recommendations for guidance to PDHRA providers to improve screening of SM behavioral health concerns and problems. Attendance at the conference provided the opportunity to receive feedback on findings from key stakeholders involved in the PDHRA process relevant to the current study and have informal conversations with installations about potential interest in participating in the current study.

Kelley, S.D., and Bickman, L. (February, 2010). Evaluation of the Post-Deployment Health Reassessment (PDHRA) Process. *Invited presentation at the Army PDHRA conference in Falls Church, Virginia.*

CONCLUSION

Progress in completing planned Year 1 SOW activities has been delayed due to several factors, including: (1) delays in completing an agreed upon data use agreement for data required by Vanderbilt and Purdue to complete analyses relevant to the training and feedback intervention design; and (2) the 2010 NDAA Sec. 708 levied additional requirements that were not anticipated at the outset of the study, which directly impacted the study design. Despite these delays, substantial work has been completed in literature review, in psychometric analysis of materials to be used in the study, in staffing and approval processes completed, in completion of data use agreements with the Army, Navy, and Air Force, in formation and receipt of guidance by the Expert Panel, and in development of a strong working relationship among FHP&R, Vanderbilt, and Purdue.

Year 2 of the period of performance is expected to be highly productive. With the DUA signed, it is expected that data will be received early in Year 2. The training and feedback intervention design is currently under revision with anticipated finalization of the design in early Year 2. Implementation of the pilot is expected by May, 2011 with data collection to continue for four months. This will be followed by analysis and manuscript preparation. Vanderbilt expects these activities to extend beyond the current period of performance and plans to request a one-year extension to allow adequate time to complete the SOW.

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APPENDIX A: SM SURVEY PSYCHOMETRICS

Introduction

In populations at high risk for mental health problems, it is beneficial to screen for such problems so that affected individuals can begin treatment early and potentially avoid long term complications or problems. Screening can be an effective, low cost way to evaluate populations at high risk for health problems and to identify individuals in need of further evaluation or treatment. There are several factors that can influence the effectiveness of screening for mental health problems in high risk populations, such as the attitudes and beliefs of the individuals being screened. Some of these factors include stigma, attitudes toward self-disclosure, help-seeking, social and work support systems, and the screening environment.

During Vanderbilt's previous evaluation of the PDHRA process, a survey was administered to examine the relationships between SM attitudes relevant to the PDHRA process and other self-reported SM characteristics The SM survey as originally administered is attached to the end of this appendix. For the purposes of the previous evaluation, the items in the survey were categorized into nine theory-based scales. The nine scales showed reasonable internal reliability within each scale (see Table A.1). The scales were evaluated using the Cronbach's coefficient alpha to assess internal consistency and reliability. Cronbach's alpha (Cohen, 1988, 1992) was calculated for each set of items, interpreting $\alpha \geq 0.80$ as satisfactory, indicating that a scale was of sufficient length and that the items appeared to be measuring similar content (Nunnally & Bernstein, 1994)

Table A.1 Number of items and standardized Cronbach's alphas for SM Survey scales

	Number of Items	Alpha (Std.)
Scale 1. Post-deployment support and help seeking	10	.77
Scale 2. Unit cohesion for personal problems	3	.88
Scale 3. PDHRA leadership support	5	.77
Scale 4. PDHRA self disclosure	3	.90
Scale 5. Satisfaction with the PDHRA provider	7	.87
Scale 6. Awareness of others' problems	4	.77
Scale 7. General willingness to self-disclose	4	.75
Scale 8. Perceived stigma related to disclosure	4	.88
Scale 9. Barriers to accepting mental health referral	7	.80

To further explore the previously developed survey for the purpose of the current project, the factorial validity of the scales were evaluated using exploratory factor analysis in order to further validate that the measurement model fits the theory of what each scale purports to measure. In exploratory factor analysis, data are described and summarized by grouping variables together that are correlated with one another. These groupings, or factors, are thus hypothesized to be measuring the same underlying (latent) processes (Tabachnick & Fidell, 2007). The results of this analysis are presented below. Note that the procedure for data collection and demographic information that follows has already been presented in Vanderbilt's previous evaluation (Bickman, et al., 2009), and is repeated here for descriptive purposes.

Methods

Data Sources

The source of data for this secondary analysis consists of an attitude and support assessment survey. Surveys were collected from 6,714 SMs during 44 PDHRA events (see Table A.2).

Service Member Survey

The SM survey included 82 items, 53 of which were measured on a 5 point Likert scale, on factors that may influence the PDHRA process (see end of this appendix for the survey). Items were either created by VU or selected from the literature. Items pertaining to post-deployment social support were taken from the Deployment Risk and Resilience Inventory (King, King, Vogt, Knight, & Samper, 2006) and the Unit Behavioral Health Needs Assessment Survey (UBHNAS; (Department of Military Psychiatry Walter Reed Army Institute of Research [WRAIR]. 2006). Items from the UBHNAS also measured barriers to care and stigma, in addition to items created by Hoge and colleagues (Hoge, et al., 2004). Items from the Self Awareness Assessment were used to measure self awareness (http://www.myskillsprofile.com/questionnaire.php). Attitudes toward help seeking were measured using items from the following measures: the UBHNAS, the Attitudes Toward Seeking Professional Psychological Help (Fischer & Turner, 1970) and questions developed by Vogel and colleagues (Vogel, Wade, Wester, Larson, & Hackler, 2007). Items measuring self disclosure were obtained from the Distress Disclosure Index (Kahn & Hessling, 2001).

Questions were also asked about the PDHRA process, such as if the SM knew the PDHRA provider prior to the interview. Some of these items were derived from a satisfaction survey created by a contractor to the Army, Booz Allen Hamilton. Other individual items included questions about the SMs plans for retirement or seeking promotion and whether they knew the DoD policy on health disclosure. Lastly, the SM survey included questions about demographic background, including, age, gender, and rank.

Procedure

SMs from each of the four military branches – Army, Navy, Marines, and Air Force – were eligible to participate in the survey. However, survey participants were recruited in different ways and at different times. Service members from the Army, Navy, and Marines were recruited during Vanderbilt University (VU) site visits to ten PDHRA events from January 2009 through April 2009. All SMs who completed the PDHRA during the site visit were eligible to participate in the survey. Participants from the Air Force were recruited online with the assistance of the Air Force Medical Operations Agency within four weeks of completing the PDHRA process. All Air Force participants completed the PDHRA between March 15, 2009 and May 15, 2009. Other SMs completed the survey in conjunction with a PDHRA event at one of 34 traveling team events held by a contracted agency who conducts PDHRA screenings for DoD; these screenings took place between March 6, 2009 and April 5, 2009. For a complete list of participants by PDHRA event location, see Table 1.

VU researchers visited ten locations to recruit SMs for surveys after they completed the PDHRA process. In order to link the survey information to the corresponding PDHRA forms, SMs were

asked to provide their birth date, initials, branch of service, and pay grade on blue cards. Each card was printed with a unique serial number, which was also printed on the survey. The cards were separated from the survey and sent to Force Health Protection and Readiness (FHP&R) where the information was placed in a spreadsheet which was then sent to an epidemiologist at the Armed Forces Health Surveillance Center (AFHSC) who had access to PDHRA files. Each record (i.e., SM) in the data set was assigned a unique ID number. The number was used to link the SM survey data and the PDHRA data. After all identifying information was removed from the PDHRA files, they were sent to Vanderbilt along with the unique ID number. Vanderbilt maintained the hard copy surveys from site visits, which contained no identifying information, when the visit was finished.

The procedure described above relates to Army, Navy, and Marine site visits. The linking procedure for Air Force participants was slightly different because no Air Force site visits were conducted; data were obtained with cooperation from the Air Force Medical Operations Agency (AFMOA). For the Air Force, individuals who had completed the PDHRA recently (March 15 through May 15, 2009) were recruited to complete the SM survey via an online survey. AFMOA provided FHP&R with the same information on the site visit cards for everyone recruited to participate, along with a unique ID number assigned to each SM. FHP&R and AFHSC used this information to match completed surveys to the corresponding PDHRAs, with the resulting de-identified linking file sent to Vanderbilt.

SMs recruited during traveling team events conducted by the contracted agency's travelling team did not use the above linking process and thus were not able to be linked to a PDHRA. The contracted agency's staff distributed and collected the surveys, and sent them to VU at the end of each event.

Note that 198 SMs who had been deployed to Kosovo and were surveyed in Johnston, IA completed the SM survey. These SMs were excluded from this analysis to maintain consistency in deployment locations (i.e., all other participants were deployed for OIF or OEF). Thus, the final dataset included a total of 44 settings (i.e., locations) based on the location of the PDHRA event and the group responsible for collecting the data: 34 traveling team events (TT) conducted by the contracted agency, 9 VU site visits, and online AF participation. Table A.2 shows the number and percentage of participants associated with each setting.

Table A.2 Total participants completing SM surveys by PDHRA setting (N=6,714)

Setting	N	%
Traveling team collection		
Ft. Gordon, GA	8	0.1
Ft. Belvoir, VA	16	0.2
Jacksonville, FL	21	0.3
Sacramento, CA	24	0.4
Cortland Manor, NY	26	0.4
Camp Pendleton, CA1	27	0.4
Schaumburg, IL	29	0.4

Setting	N	%
Little Rock, AR	35	0.5
Lexington, KY	39	0.6
Alameda, CA	39	0.6
San Diego, CA	40	0.6
Manistee, MI	41	0.6
North Little Rock, AR2	43	0.6
Geneseo, NY	44	0.7
Wyoming, MI	47	0.7
Cadillac, MI	49	0.7
Bossier City, LA	50	0.7
Lima, OH	53	0.8
Dowagiac, MI	57	0.8
Camp Pendleton, CA2	64	1.0
Annville, PA	66	1.0
Tucson, AZ	67	1.0
North Little Rock, AR	68	1.0
Sandusky, OH	78	1.2
Camp Roberts, CA	87	1.3
Tiffin, OH	90	1.3
Murray, KY	91	1.4
North Little Rock, AR	93	1.4
Cleveland, OH	130	1.9
Barrigada, GU	150	2.2
Arkadelphia, AR	190	2.8
Walbridge, OH	204	3.0
Evansville, IN	529	7.9
Indianapolis, IN	1173	17.5
Vanderbilt University site visit collection		
Milwaukee, WI	64	1.0
Quantico, VA	68	1.0
Camp Pendleton, CA	102	1.5
Port Hueneme, CA	136	2.0
Ft. Drum, NY	140	2.1
San Diego, CA	312	4.6
Ft. Riley, KS	489	7.3
Ft. Wayne, IN	501	7.5
Ft. Campbell, KY	878	13.1
Online collection		
Air Force	256	3.8
Total	**6714**	**100.0**

Study Population

Basic demographic characteristics of the SMs are presented here for informational purposes. Because a random sampling procedure was not feasible for this study, these data are not

representative of all military personnel, or military personnel in a particular Service Branch or Component. Population characteristics are presented for informational purposes only and were not used to analyze group differences.

Branch and Component

Table A.3 shows that survey participants served with the four main military branches – Army, Marines, Air Force, and Navy. However, the percentage associated with each branch is highly variable. The vast majority of SMs (83%) were Army; relatively few were in the Navy (2%) or Air Force (4%). The sample is also unevenly distributed by component. While most (59%) participants were in the National Guard, very few were in the Reserve (6%). The distribution of participants by component was highly associated with Service Branch. For example, 100% of participants in the Air Force and Navy had active duty status.

Table A.3 Component by Branch

	Army N=5540	Marines N=782	Navy N=136	Air Force N=256	Total N=6714
Component					
National Guard	71.6%	0.0%	0.0%	0.0%	59.1%
Active	27.2%	52.9%	100.0%	100.0%	34.5%
Reserve	1.2%	47.1%	0.0%	0.0%	6.4%
Total	82.6%	11.6%	2.0%	3.8%	100%

Rank/Grade

As Table A.4 shows, most (51%) participants were enlisted with a pay grade of E01 to E04; about a third were E5-E6, with categories by rank/grade decreasingly represented as rank/grade increased. While this pattern was found across all branches of the military, participants in the Air Force tended to be of higher rank than those in other branches of service.

Table A.4 Rank/Grade by Branch

	Army N=5369	Marines N=775	Navy N=133	Air Force N=255	Total N=6532
Rank or Grade					
E1-E4	50.2%	66.1%	60.9%	23.1%	51.3%
E5-E6	32.2%	25.2%	34.6%	42.7%	31.8%
E7-E9	7.6%	4.1%	2.3%	16.5%	7.4%
O1-O3	6.5%	3.5%	2.3%	8.6%	6.2%
O4-O9	1.7%	1.2%	.0%	9.0%	1.9%
W01-W05	1.7%	.0%	.0%	.0%	1.4%

Table A.5 shows that participant's rank varied by Service component. For example, a larger proportion of survey participants in the Reserves had lower grade/rank than other participants in other service components.

Table A.5 Rank by Service Component

Grade or Rank	Active N=2253	National Guard N=3851	Reserve N=428	Total N=6352
Rank or Grade				
E1-E4	44.1%	53.3%	70.3%	51.3%
E5-E6	34.1%	31.6%	22.2%	31.8%
E7-E9	8.6%	7.2%	3.3%	7.4%
O1-O3	8.2%	5.4%	2.3%	6.2%
O4-O9	2.0%	1.8%	1.6%	1.9%
W01-W05	3.0%	0.6%	0.2%	1.4%

Age

While most (38%) participants were less than 25 years old, older age groups were well represented (Table A.6). However, age tended to vary by Service component, at least among survey participants (Table A.7). Reservists tended to be younger than those in Active Duty or the National Guard – 61% were between 18-24 years old compared to 41% and 34% respectively. Participants in the National Guard were more than twice as likely (15%) as others to be 40 or more years of age.

Table A.6 Age by Branch

	Army N=5519	Marines N=781	Navy N=136	Air Force N=254	Total N=6690
Age					
18-24	35.3%	62.2%	61.0%	19.3%	38.3%
25-29	25.8%	22.9%	27.9%	31.1%	25.7%
30-39	25.7%	12.7%	10.3%	32.3%	24.1%
40 or over	13.2%	2.2%	0.7%	17.3%	11.8%

Table A.7 Age by Component

	Active N=2303	National Guard N=3954	Reserve N=433	Total N=6690
Age				
18-24	41.0%	34.4%	60.5%	38.3%
25-29	28.4%	24.6%	22.4%	25.7%
30-39	23.4%	25.8%	12.0%	24.1%
40 or over	7.2%	15.2%	5.1%	11.8%

Gender

While most participants were unsurprisingly male (92%) in all branches of service, females were about twice as likely to be in the Air Force (20%) or Navy (16%) than in the Army (8%) (Table A.8). Gender also varied by Component. While nearly all (98%) reservists are male, a larger proportion of females are active duty (11%) or in the National Guard (7%) (Table A.9).

Table A.8 Gender by Branch

	Army N=5337	Marines N=775	Navy N=132	Air Force N=253	Total N=6497
Gender					
Male	92.3%	96.4%	84.1%	80.2%	92.1%
Female	7.7%	3.6%	15.9%	19.8%	7.9%

Table A.9 Gender by Component

	Active N=2247	National Guard N=3823	Reserve N=427	Total N=6497
Gender				
Male	89.2%	93.3%	97.7%	92.1%
Female	10.8%	6.7%	2.3%	7.9%

Analyses

SM Survey Scaling Procedure

The total sample of 6,714 SMs who responded to the survey were split into two random sub-samples (Sample One n=3,316 and Sample Two n=3,398) for replication purposes. Using only the data from sample one, all of the 5-scale Likert items on the SM survey that corresponded to the nine, previously defined, theory-based scales were entered into exploratory factor analysis (EFA) with oblique rotation. Inspection of Eigenvalues allows for the investigation of the number of factors (or dimensions) the individual items are measuring. Generally, every eigenvalue over one indicates the potential of a unique factor being measured. Without restrictions, the EFA yielded 10 factors with Eigen values greater than one. Further exploration of these factors led to the discovery of a dublet (a factor with only two items loading on to it). The same EFA procedure was repeated with the additional restriction added in the syntax to allow only nine factors. This process was repeated until dublets no longer existed and cross loadings (items loading on multiple factors) were minimized. The final number of unique factors observed for this sample was eight.

The same EFA procedure described above was repeated for an independent sample, sample two. With no restrictions placed on this procedure, the second sample yielded 11 factors. However, when the same restrictions and iterations of analysis were applied to the data, the

final results also observed eight unique factors. This replication in an independent sample increases our confidence that the SM survey is, in fact, measuring eight unique factors.

Once these eight factors were distinguished, a closer look revealed that one factor had items with conflicting item loadings, indicating a factor with poor quality characteristics. The factor consisted of the following items:

- 49. (Referral NOT helpful because…) I can handle problems on my own or with help from family or friends
- 24. Emotional problems are more likely to be solved with professional help than by trying to solve them alone
- 12. I admire people who solve their own problems ***without*** seeking professional help

The factor loading for item 49 was in the opposite direction of the other two items. Additionally, the factor also had poor reliability, most likely due to the reverse recoding of item 12. For these reasons, this factor was eliminated as a scale.

Across both independent samples, factor loading results were extremely similar; in fact, 49 of the 50 items had the strongest factor loadings on the same corresponding factors. This increases confidence in our findings. Items with dissimilar item loadings or that display poor qualities were identified for removal from scales. Table A.10 shows the items that were removed from the scales due to poor quality characteristics such as (1) factor loadings of less than 0.3 across both samples; (2) Inconsistent loadings across both samples.

Table A.10 Items removed from the SM Survey scales due to poor characteristics

Scale	Description	Items Removed
1	*Attitudes about self disclosing and attitudes after self disclosure*	*"People rarely talk to me about their personal problems"*
1 or 5	*(1) and (5) Awareness of other's problems*	*"I am aware of my moods and feelings"*
6	*Barriers to accepting mental health*	*"The provider seemed out of touch with what it was like to be deployed"*

The final factor results for the remaining 43 items are shown in Table A.11. This table presents the items that make up each scale, the Cronbach's internal consistency reliability estimates, the corresponding factor loadings from sample one and two, and the average factor loadings across samples. A Cronbach's alpha greater than 0.80 is considered satisfactory. There were a total of seven factors, or scales.

Table A.11 EFA factor loadings for final scales

	Factor Loadings		
	Sample 1	Sample 2	Average Sample 1&2
Scale 1: Attitudes about self disclosing and attitudes after self disclosure ***α=.844***	12 items		

	Factor Loadings		
	Sample 1	Sample 2	Average Sample 1&2
20. I prefer ***not*** to talk about my problems	0.55	0.68	0.62
13. When something unpleasant happens to me, I often look for someone to talk to	0.58	0.65	0.61
15. When I feel depressed or sad, I tend to keep those feelings to myself	0.51	0.64	0.57
23. Among my friends or relatives, there is someone I go to when I need good advice	0.53	0.46	0.49
19. I am carefully listened to and understood by family members or friends	0.52	0.43	0.48
8. I am willing to tell others my distressing thoughts	0.47	0.45	0.46
14. Among my friends or relatives, there is someone who makes me feel better when I am feeling down	0.50	0.39	0.45
9. I have problems that I ***can't*** discuss with family or friends	0.45	0.44	0.44
16. There are people to whom I can talk about my deployment experiences	0.51	0.36	0.43
17. If I were feeling upset or down for a long time I would want to get help	0.43	0.38	0.40
10. If I thought I needed it, I would get psychological counseling	0.34	0.30	0.32
11. People at home just ***don't*** understand what I have been through while in the Armed Forces	0.33	0.30	0.32
Scale 2: Unit and NCO support **α=.857**	8 items		
31. (About military job) If I had an emotional or family problem someone in my unit would figure out a way to help me	0.83	0.81	0.82
30. (About military job) If I were stressed or feeling down someone in my unit would be supportive	0.83	0.80	0.82
33. (About unit NCO) Encourages unit members to be open about any problems they might be experiencing on the DD Form 2900	0.72	0.73	0.72
29. (About military job) The members of my unit know that they can depend on each other	0.70	0.75	0.72
32. (About unit NCO) Makes sure that there is time to attend appointments for physical, mental, or dental health	0.66	0.66	0.66
34. (About unit NCO) Strongly supports the PDHRA process	0.55	0.58	0.57
36. (About unit NCO) Has talked about his or her own service-related mental health problems or treatment	0.42	0.33	0.38
35. (About unit NCO) Has no compassion for unit members experiencing emotional or family problems	0.34	0.41	0.38
Scale 3: PDHRA self disclosure – Honesty ***α=.905***	3 items		
57. (I fully disclosed...) Any problems or concerns about my emotional health	0.94	0.97	0.96
56. (I fully disclosed...) Any problems or concerns about my physical health	0.84	0.88	0.86

	Factor Loadings		
	Sample 1	Sample 2	Average Sample 1&2
58. (I fully disclosed...) Any problems or concerns about alcohol use	0.85	0.86	0.86
Scale 4: Satisfaction with PDHRA provider α=.914	6 items		
65. I felt a great deal of trust in the provider	0.83	0.89	0.86
66. I learned a lot from the provider67. Did you know the provider who did the PDHRA interview before this contact?	0.83	0.85	0.84
64. The provider helped me be more aware of my problems	0.84	0.81	0.82
61. The provider reviewed my health in adequate detail	0.78	0.80	0.79
60. The provider who did the PDHRA interview showed interest and concern for my well-being	0.78	0.79	0.78
63. I felt the provider could help me get access to the care I need	0.74	0.71	0.73
Scale 5: Awareness of others' problems α=.774	4 items		
26. I can spot the signs of depression	0.80	0.75	0.78
25. I can spot the signs of post-traumatic stress (PTSD)	0.74	0.72	0.73
27. I can spot the signs of a concussion	0.65	0.65	0.65
28. I know what to look for to determine if someone is drinking too much alcohol	0.51	0.57	0.54
Scale 6: Barriers to accepting mental health referral α=.803	6 items		
44. (Referral NOT helpful because…) It would cost too much money	0.70	0.74	0.72
43. (Referral NOT helpful because…) It would be too hard to get time off work	0.62	0.64	0.63
46. (Referral NOT helpful because…) The services provided are ***not*** effective	0.59	0.62	0.61
45. (Referral NOT helpful because…) The visit would ***not*** remain confidential	0.53	0.54	0.53
47. (Referral NOT helpful because…) The medications that I might be given have too many bad side effects	0.51	0.43	0.47
48. (Referral NOT helpful because…) Religious counseling would be more helpful than mental health treatment	0.37	0.28	0.33
Scale 7: Perceived consequences of self disclosure α=.884	4 items		
42. (If I revealed any emotional problems…) My unit leadership would have doubts about my dependability	0.85	0.79	0.82
41. (If I revealed any emotional problems…) Members of my unit would have less confidence in me	0.83	0.78	0.80
40. (If I revealed any emotional problems…) It could harm my career	0.79	0.73	0.76
38. (If I revealed any emotional problems…) I could be denied a security clearance in the future	0.65	0.61	0.63

Table A.12 shows the correlations among the seven new SM survey scales. The scales were correlated as expected and were similar to the correlations between the scales developed in the previous evaluation. Note that all correlations were statistically significant; more meaningful however, are those with moderate (0.30) to large (0.50) effect sizes (Cohen, 1988, 1992). These are bolded in the table.

Table A.12 Correlations among newly formed SM survey scales

	1	2	3	4	5	6	7
Scale 1: Attitudes about self disclosing and attitudes after self disclosure	--						
Scale 2: Unit and NCO support	**.47**	--					
Scale 3: PDHRA self disclosure- Honesty	.26	.23	--				
Scale 4: Satisfaction with PDHRA provider	**.37**	**.39**	.29	--			
Scale 5: Awareness of others' problems	**.30**	**.30**	.18	.19	--		
Scale 6: Barriers to accepting mental health referral	**-.41**	**-.36**	-.18	-.28	-.11	--	
Scale 7: Perceived consequences of self disclosure	**-.38**	**-.33**	-.14	-.22	-.09	**.54**	--

These newly formed scales changed only slightly from the older, theoretically-based scales. The new analyses provide confidence that the scales are now more robust. For the purpose of this study, the new, psychometrically-sound scales will be replace the use of individual items and previously developed scales.

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Today's Date: _____

Location Code: _____

Instructions: *This study is being conducted by Vanderbilt University, which has been contracted by the DoD to provide an evaluation of the post-deployment health re-assessment process (PDHRA). Your opinions and experience will help the military improve health care for all Service Members. This questionnaire will take about 15 minutes or less to finish, and your participation is voluntary. You can skip any questions or refuse to answer any questions. Your answers will remain confidential and will not be connected to who you are.*

The PDHRA is a medical screening for both behavioral health and physical health concerns. It is to help you access resources for any concerns you may have about your health after returning from deployment. The PDHRA consists of a self-report questionnaire called the DD Form 2900 and speaking one-on-one with a health care provider. The PDHRA typically occurs 90 – 180 days after returning from deployment.

Age	**Gender**	**Grade / Rank**
____ 18-24	____ Male	____ E1-E4
____ 25-29	____ Female	____ E5-E6
____ 30-39		____ E7-E9
____ 40 or over		____ O1-O3
		____ O4-O9
		____ W01-W05

Please fill in the blank with a number from 0 to 100%.

ADSM01S 1. What percentage of the Service Members returning from OIF/OEF would you estimate have symptoms of Post-traumatic Stress Disorder (PTSD)? _____ %

ADSM02S 2. What percentage of the Service Members returning from OIF/OEF would you estimate received a deployment-related concussion? _____ %

For the remainder of the questionnaire, please mark your answers by putting an 'X' in <u>one</u> box for each numbered item. *If you would like to change an answer you already marked, please fill in the entire box of the incorrect answer and mark the appropriate answer with an 'X'.* ***Only answers with an 'X' will be recorded.***

Mark 'Yes' or "No' for each of the following questions.

ADSM03	3. At least one NCO or Officer from my current unit was in theater with me on my last deployment	Yes ☐	No ☐
ADSM04	4. At least one unit NCO or Officer briefed my unit on the PDHRA	Yes ☐	No ☐
ADSM05	5. Are you planning to separate from the military in the next 6 months?	Yes ☐	No ☐
ADSM06	6. Are you seeking promotion within the military in the next 6 months?	Yes ☐	No ☐

The following questions are about any deployment cycle education you may have received to help Service Members reintegrate post-deployment. The education may be written materials, websites, films, or videos that provide information on the kinds of problems that Service Members might face post-deployment.

For question 7, please mark 'Yes' or 'No' in the 1st column, and if YES, please indicate if the materials were "Helpful" or Not Helpful" in the 2nd column.		**If YES, was the material helpful?**
7. To help you reintegrate post-deployment, did you		ADSM7D
ADSM7A a. Read any written materials?	Yes ☐ No ☐	Helpful ☐ Not Helpful ☐
ADSM7B b. View any websites?	Yes ☐ No ☐	ADSM7E Helpful ☐ Not Helpful ☐
ADSM7C c. See a film or video not on the Web?	Yes ☐ No ☐	Helpful ☐ Not Helpful ☐ ADSM7F

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How much do you DISAGREE or AGREE with the statements below…

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
ADSM08	8. I am willing to tell others my distressing thoughts	☐	☐	☐	☐	☐
ADSM09	9. I have problems that I ***can't*** discuss with family or friends	☐	☐	☐	☐	☐
ADSM10	10. If I thought I needed it, I would get psychological counseling	☐	☐	☐	☐	☐
ADSM11	11. People at home just ***don't*** understand what I have been through while in the Armed Forces	☐	☐	☐	☐	☐
ADSM12	12. I admire people who solve their own problems ***without*** seeking professional help	☐	☐	☐	☐	☐
ADSM13	13. If something unpleasant happens to me, I often look for someone to talk to	☐	☐	☐	☐	☐
ADSM14	14. Among my friends or relatives, there is someone who makes me feel better if I am feeling down	☐	☐	☐	☐	☐
ADSM15	15. If I feel depressed or sad, I tend to keep those feelings to myself	☐	☐	☐	☐	☐
ADSM16	16. There are people to whom I can talk about my deployment experiences	☐	☐	☐	☐	☐
ADSM17	17. If I were feeling upset or down for a long time I would want to get help	☐	☐	☐	☐	☐
ADSM18	18. People rarely talk to me about their personal problems	☐	☐	☐	☐	☐
ADSM19	19. I am carefully listened to and understood by family members or friends	☐	☐	☐	☐	☐
ADSM20	20. I prefer ***not*** to talk about my problems	☐	☐	☐	☐	☐
ADSM21	21. I am aware of my moods and feelings	☐	☐	☐	☐	☐
ADSM22	22. I ***don't*** allow my feelings to influence my decisions	☐	☐	☐	☐	☐
ADSM23	23. Among my friends or relatives, there is someone I go to if I need good advice	☐	☐	☐	☐	☐
ADSM24	24. Emotional problems are more likely to be solved with professional help than by trying to solve them alone	☐	☐	☐	☐	☐
ADSM25	25. I can spot the signs of post-traumatic stress (PTSD)	☐	☐	☐	☐	☐
ADSM26	26. I can spot the signs of depression	☐	☐	☐	☐	☐
ADSM27	27. I can spot the signs of a concussion	☐	☐	☐	☐	☐
ADSM28	28. I know what to look for to determine if someone is drinking too much alcohol	☐	☐	☐	☐	☐

How much do you DISAGREE or AGREE with the statements below, about your military job…

ADSM29	29. The members of my unit know that they can depend on each other	☐	☐	☐	☐	☐
ADSM30	30. If I were stressed or feeling down someone in my unit would be supportive	☐	☐	☐	☐	☐
ADSM31	31. If I had an emotional or family problem someone in my unit would figure out a way to help me	☐	☐	☐	☐	☐

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How much do you DISAGREE or AGREE with the statements below...

	My unit NCO...	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
ADSM32	32. Makes sure that there is time to attend appointments for physical, mental, or dental health	☐	☐	☐	☐	☐
ADSM33	33. Encourages unit members to be open about any problems they might be experiencing on the DD Form 2900	☐	☐	☐	☐	☐
ADSM34	34. Strongly supports the PDHRA process	☐	☐	☐	☐	☐
ADSM35	35. Has ***no*** compassion for unit members experiencing emotional or family problems	☐	☐	☐	☐	☐
ADSM36	36. HAs talked about his or her own service-related mental health problems or treatment	☐	☐	☐	☐	☐
ADSM37	37. My answers to the above questions would be the same for my unit officer	☐	☐	☐	☐	☐
	If I were to reveal any emotional or mental health problems on a PDHRA it is likely that...					
ADSM38	38. I could be denied a security clearance in the future	☐	☐	☐	☐	☐
ADSM39	39. It would assist me in finding the help I need	☐	☐	☐	☐	☐
ADSM40	40. It could harm my career	☐	☐	☐	☐	☐
ADSM41	41. Members of my unit would have less confidence in me	☐	☐	☐	☐	☐
ADSM42	42. My unit leadership would have doubts about my dependability	☐	☐	☐	☐	☐
	Being referred to a mental health provider would NOT be helpful because...					
ADSM43	43. It would be too hard to get time off work	☐	☐	☐	☐	☐
ADSM44	44. It would cost too much money	☐	☐	☐	☐	☐
ADSM45	45. The visit would ***not*** remain confidential	☐	☐	☐	☐	☐
ADSM46	46. The services provided are ***not*** effective	☐	☐	☐	☐	☐
ADSM47	47. The medications that I might be given have too many bad side effects	☐	☐	☐	☐	☐
ADSM48	48. Religious counseling would be more helpful than mental health treatment	☐	☐	☐	☐	☐
ADSM49	49. I can handle problems on my own or with help from family or friends	☐	☐	☐	☐	☐

ADSM50 50. Since returning from your last deployment have you experienced an emotional, alcohol, stress, or family problem? Yes ☐ No ☐

If no, skip to question #51 *If yes*, have you talked to any of the following individuals about it?

ADSM50A 50a. Medical Professional Yes ☐ No ☐

ADSM50B 50b. Mental Health Professional Yes ☐ No ☐

ADSM50C 50c. Religious or spiritual leader Yes ☐ No ☐

ADSM50D 50d. Family or friend Yes ☐ No ☐

ADSM51 51. Have any friends or family suggested that you seek help from a professional (such as a counselor, doctor, clergy, etc.) for an emotional, alcohol, stress, or family problem? Yes ☐ No ☐

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The following questions ask about your experience completing the PDHRA process. It is important to know the degree to which Service Members disclose information on the PDHRA so that we can understand how to improve the process. Remember, your answers will not be linked to your name so your responses will remain confidential.

ADSM52 52. Have you completed the PDHRA since your last deployment?

Yes, on a computer ☐ ADSM52A Yes, on the telephone ☐ ADSM52B Yes, using paper and pencil ☐ ADSM52C No ☐ ADSM52D

If no, skip to question #69

ADSM53 53. Where were you when you completed the PDHRA (DD Form 2900)?

ADSM53A I was by myself ☐ I was in a group where others were also completing the form ☐ ADSM53B

ADSM54 54. When I completed the PDHRA (DD Form 2900) I was… On duty ☐ ADSM54A Off duty ☐ ADSM54B

How much do you DISAGREE or AGREE with the statements below…

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
ADSM55	55. Completing DD Form 2900 helped me identify my concerns	☐	☐	☐	☐	☐

On the self-report questionnaire (DD Form 2900) I fully disclosed…

ADSM56	56. Any problems or concerns about my **physical** health	☐	☐	☐	☐	☐
ADSM57	57. Any problems or concerns about my **emotional** health	☐	☐	☐	☐	☐
ADSM58	58. Any problems or concerns about **alcohol use**	☐	☐	☐	☐	☐

ADSM59 59. After completing DD Form 2900, did you complete a one-on-one interview with a health care provider?

Yes, by telephone ☐ ADSM59A Yes, in person ☐ ADSM59B No ☐ ADSM59C

If no, skip to question #69

How much do you DISAGREE or AGREE with the statements below…

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
ADSM60	60. The provider who did the PDHRA interview showed interest and concern for my well-being	☐	☐	☐	☐	☐
ADSM61	61. The provider reviewed my health in adequate detail	☐	☐	☐	☐	☐
ADSM62	62. The provider seemed out of touch with what it is like to be deployed	☐	☐	☐	☐	☐
ADSM63	63. I felt the provider could help me get access to the care I need	☐	☐	☐	☐	☐
ADSM64	64. The provider helped me be more aware of my problems	☐	☐	☐	☐	☐
ADSM65	65. I felt a great deal of trust in the provider	☐	☐	☐	☐	☐
ADSM66	66. I learned a lot from the provider	☐	☐	☐	☐	☐

ADSM67 67. Did you know the provider who did the PDHRA interview before this contact? Yes ☐ No ☐

ADSM67A 67a. *If yes*, was the provider associated with your unit when you were deployed? Yes ☐ No ☐

ADSM68 68. How long was the PDHRA interview?

Less than 5 minutes ☐ 5 – 10 minutes ☐ 11 – 15 minutes ☐ 16 – 25 minutes ☐ 26 minutes or more ☐

ADSM69 69. Did you know that current DoD policy no longer requires military personnel to disclose service-related mental health treatment when applying for security clearance? Yes ☐ No ☐

APPENDIX B: VANDERBILT LITERATURE REVIEW—STRATEGIES TO ENHANCE PROVIDER COMMUNICATION AND DECISION MAKING

Introduction

This review of the literature was conducted to determine the structure, content, and effectiveness of several strategies used to improve provider communication and decision making. This includes trainings that specifically focus on communication skills and interview style. These improved communication strategies are intended to create better relationships with the patients, thereby increasing information elicited by the patient and improving compliance with medical regimen. However, training alone does not produce sustainable practice behavior changes. The effectiveness of training can be maximized with the addition of ongoing supports, such as the provision of decision support and feedback aids. Studies are summarized that describe quality indicators of feedback and decision support for Post Deployment Health Reassessment (PDHRA) providers. Focus is also given to studies that have validated or utilized the behavioral health subscales contained in the PDHRA.

Background

Changing provider practice behavior is not an easy endeavor (Bennett, et al., 2000; Davis, 1998; Davis, et al., 1999). Identifying the mechanisms behind change is complex, as multiple perspectives are often needed to find an effective common ground (Sexton & Kelley, 2010). Traditional means of introducing information to influence behavior, such as educational materials and workshops, have generally not resulted in long-term provider behavior change or patient outcomes improvement. Dissemination of educational guidelines may increase provider access to information, but does not create lasting behavior change without the addition of enabling or reinforcing strategies, such as feedback (Veloski, Boex, Grasberger, Evans, & Wolfson, 2006). To effectively learn from experience, reliable knowledge about the success or failure of performance is necessary. Unfortunately, the environmental cues of success available to providers are often vague and unsystematic (Bickman, 1999).

In Vanderbilt University's previous evaluation of the PDHRA process, it was concluded that health care providers who conduct PDHRAs would benefit from a training and feedback intervention (Bickman, et al., 2009). For example, the relationship between multiple PDHRAs completed by the Service members (SMs) for the same deployment was explored. Even when the process was completed twice within one week, the aggregated correlations within the first week were about twice as high for the SM self-report portion (r= 0.88 for PDHRA) compared to the provider portion (r=0.46 for PDHRA). Thus, when SMs are presenting similarly on different days to different providers, the providers are documenting different risk assessments, major concerns, and referrals (Bickman, et al., 2009). This indicates minimally shared approach taken by providers and indicates a need to increase accuracy and reliability of the clinical interviews as documented on the PDHRA. The low agreement of providers is not likely due to intervening health care or changes in the SMs' health status, which could be expected to be somewhat stable within a seven-day period.

Variability can be introduced to a clinical interview from several sources, including experience and knowledge of the health care provider, interview style and fact-finding techniques, context of the interview, and cognitive biases, errors and heuristics in clinical decision making (van Ryn, 2002). Substantial variability in PDHRA provider interviews was discovered during the Vanderbilt evaluation (Bickman, et al., 2009); it was found that providers treat behavioral health problems differently than physical health problems. For example, when physical health problems were endorsed by the SM on the self-report providers almost always asked about previous treatment (87% to 92%), but when mental health symptoms were endorsed providers were much less likely to ask about previous treatment (50% to 64%). One way to decrease this variability is to provide decision supports, which can range from clinical guidelines (e.g., on utilization of self-report items and provider documentation) to interpretation through actuarial modeling (e.g., Dawes, Faust, & Meehl, 1989).

Evidence shows the clinical interview has strengths and weaknesses in screening and is therefore most effective when combined with an actuarial process. Research over the last 70 years has consistently found that actuarial decision making is more accurate and less variable than clinical decision making in most cases. In a review of 617 comparisons in 136 studies published between 1920 and 1994, Grove et al. (2000) found only eight studies in which clinical decision making surpassed the accuracy of actuarial decision making. Several factors have been cited as possible explanations for the superiority of actuarial over clinical decision making. First and foremost, the human brain is not efficient at noticing, selecting, categorizing, retaining, retrieving, manipulating, and appropriately applying information for the purpose of making inferences (Grove & Meehl, 1996). As a result, clinical decision making is prone to fluctuations in judgment due to the influence of cognitive errors, application of heuristics, and biases (Dawes, et al., 1989).

Despite the weaknesses of clinical interviews, they do carry inherent strengths, such as the ability of providers to probe and ask follow-up questions. Clinical decision making offers a several important benefits that actuarial-only decision systems simply cannot provide. For example, humans can notice significant exceptions that may call into question actuarial conclusions. Moreover, any actuarial formula, like the clinical-decision process, will lead to false positives and false negatives. Health care providers are in a unique position to adjust decision model cutoffs depending on reasoned judgments about the relative consequences of false positives and false negatives for a given individual. In addition, health care providers can collaborate with patients to make treatment decisions that take into account individual values and preferences (Frosch & Kaplan, 1999), while actuarial systems alone cannot. While standard actuarial-based assessments can improve the reliability of clinical interviews, the overall impact of the session can be strengthened based on the correct interpretation and use of the information by the provider (Hughes, et al., 2000). Health care providers may bring to bear advanced knowledge on the interpretation of the “clinical significance” of assessment results in light of contextual variables.

Communication Skills Training

The self-reported portion of the PDHRA provides a huge amount of clinical information, but the providers who interview SMs are in a position to further extract information from the SMs that may be particularly sensitive and thus not self-reported. In order to elicit sensitive information and improve the encounter, effective provider communication skills are necessary. Epstein et al. (1993) defined the effectiveness of medical encounters broadly in terms of the degree to which the following three goals are achieved: (a) data gathering, (b) patient education, and (c) relationship building. A fourth goal has since been added (Roter, 2002): activating and partnership building. Effective communication patterns in medical encounters can facilitate each of these goals in that they provide a balance between absolute patient autonomy and what may be seen as provider paternalism. Effective communication redistributes interpersonal power in an equitable way, serving to activate partnership building. Effective communication also builds rapport and increases familiarity. In medical encounters, patients and physicians should share the same goals. Interestingly and in support of this, primary care physicians and their patients were least satisfied with "narrowly biomedical" encounters compared to medical encounters in which patient values were respected and psychosocial talk was more prevalent (Roter, et al., 1997).

Research has consistently found that effective communication (both verbal and non-verbal) is a fundamental requirement for the provision of appropriate health services (Collins, et al., 2002). Interpersonal interaction and communication affects patients' attitudes, responsiveness, adherence to health care provider instructions, and subsequent utilization of the health care system (Collins, et al., 2002; van Ryn, 2002). For this reason, training in communications skills is an important aspect of increasing positive patient outcomes.

Structure

Intense Trainings Are More Effective Than Brief Trainings

A positive relationship has been found between training intensity and effectiveness of the training (Rao, Anderson, Inui, & Frankel, 2007). Many effective clinician training programs reviewed were moderate to high intensity, involving at least one day of initial training (Fallowfield, et al., 2003; Levinson & Roter, 1993; Rao, et al., 2007). In fact, some studies with extensive trainings reported less attrition in positive behavior and an increase in positive effects (e.g., fewer interruptions and more summarizing of information) more than a year after training that were not apparent at three months (Fallowfield, Jenkins, Farewell, & Solis-Trapala, 2003). Some studies have shown that brief trainings can be effective (Lewis, Pantell, & Sharp, 1991), but in general shorter trainings were not effective or less effective (Cheraghi-Sohi & Bower, 2008; Joos, 1996; Levinson & Roter, 1993) and longer trainings were usually related to more positive outcomes (Ammentorp, Sabroe, Kofoed, & Mainz, 2007; Fallowfield, et al., 2003; Frostholm, et al., 2005; Lustig, et al., 2001; Roter, et al., 1995). In addition to longer training sessions, consistent follow-up "boosters" that include the dissemination of data on implementation of the communication skills and self-assessments have been found to be

effective (Lewis, et al., 1991).

Content

Communication Skills Training is Related to Positive Patient Outcomes

Effective provider training programs focus on a few core components such as content training, communication skills training, interview style, and proper documentation techniques. Communication skills training is one important step in ensuring that health care providers become better at performing assessments. While experienced providers may be fluent with content (e.g., symptoms related to behavioral health problems), evidence suggests that interactions can be enhanced by attention to interpersonal communication patterns (e.g. active listening). Fortunately, using enhanced communication skills doesn't necessarily increase the length of the visit (Roter, et al., 1997; Roter, et al., 1995) unless a pre-visit questionnaire is administered and has to be reviewed by the provider (Hornberger, Thom, & MaCurdy, 1997).

Due to a lack of adequate research design, outcomes of communication skills training, including provider behavior change, patient satisfaction, and patient outcomes, tend to be variable (Griffin, et al., 2004; Hulsman, Ros, Winnubst, & Bensing, 1999). Despite this lack of consistency in the literature, positive results have been discovered. Providers who have received training on interpersonal communication skills provide more medical counseling (L. D. Brown, et al., 2000), elicit more information and concerns from the patient (Joos, 1996; Langewitz, et al., 1998; Rao, et al., 2007), exhibit greater facilitative communication and information giving (Kim, et al., 2002; Rao, et al., 2007), ask more open ended questions, more frequently ask opinions, give more biomedical information, have less negative affect (Levinson & Roter, 1993), and generally had improved communication skills (Fallowfield, et al., 2003; Rao, et al., 2007). They were also more likely to receive higher patient satisfaction ratings (Frostholm, et al., 2005; Rao, et al., 2007) than providers who used narrow biomedical communication patterns (Roter, et al., 1997). Trained providers were also more likely to recognize patients' psychosocial problems (Hulsman, et al., 1999). In addition, trained providers also used more problem-defining and emotion-handling skills and elicited more psychosocial problems from their patients (Roter, et al., 1995). Finally, trained providers screened more often for and provided more information regarding important risk factors during well visits (Lustig, et al., 2001) and scored higher in clinical proficiency (Roter, et al., 1995). These positive effects of training are often still apparent after a year. Even after twelve months, trained providers asked fewer leading questions, asked focused and open-ended questions, and responded well to patient cues (Fallowfield, et al., 2003). Providers' own self-confidence improved for specific communication tasks (Ammentorp, et al., 2007) and dealing with difficult patients (Stein, Frankel, & Krupat, 2005).

Patients who saw providers who received training in interpersonal skills communicated more during the interaction (Brown, et al., 2000), disclosed more medical and psychosocial information (Brown, et al., 2000; Levinson & Roter, 1993), and perceived receiving more information from the provider (Joos, 1996; Rao, et al., 2007). In addition, they were more satisfied with the provider (Brown, et al., 2000) and were less emotionally distressed six months later (Roter, et al., 1995). While there is not sufficient evidence that communication skills training is related to a significant improvement on health status (Hulsman, et al., 1999),

patients of trained providers had less negative affect and showed fewer distress signs during the visit (Levinson & Roter, 1993).

Interview Style Affects Information Elicited by Patient

Context describes the method of data collection (e.g., phone, face-to-face) and interview style, while fact-finding techniques describe the general verbal and non-verbal strategies used by the health care providers to elicit and clarify information during the interview process. Unless the interview style and fact finding procedures are standardized, health care providers may vary widely in the particular strategies they adopt. Studies dealing primarily with mental health conducted over the last few decades have found that clinical interview styles can have a significant impact on the nature of information elicited, and subsequent diagnoses rendered (Cox, Holbrook, & Rutter, 1981; Cox, Rutter, & Holbrook, 1981; Graham & Rutter, 1968; Hopkinson, Cox, & Rutter, 1981; Rutter & Cox, 1981; Rutter, Cox, Egert, Holbrook, & Everitt, 1981; Rutter & Graham, 1968). Traditionally, four distinctive styles of clinical interview have been identified: (1) the *sounding board style* characterized by minimal activity on the interviewer's part; (2) the *active psychotherapy style* characterized by frequent use of techniques to elicit feelings from the interviewee; (3) the *structured interview style* characterized by an active fact-oriented technique on the part of the interviewer, and (4) the *systematic exploratory style* characterized by both high fact and high feeling-oriented techniques. Research involving the direct comparison of these interview styles has found that health care providers employing the two fact-oriented techniques (structured interview and systematic exploratory) identified more symptoms of psychopathology and were better at identifying negative diagnoses (Cox, Rutter, et al., 1981). Other studies have found that utilizing more structured interview protocols, in general, may decrease variability in psychiatric diagnosis assigned (Hughes, et al., 2000; Piacentini, et al., 1993).

Interactive Trainings Are Effective

A recent review indicates that didactic trainings (e.g., typical CME workshops) are less effective than mixed didactive and interactive workshops for improving health care provider practice and health care outcomes (Forsetlund, et al., 2009; Roter, et al., 1995). The use of role play and/or simulated patients (Lane & Rollnick, 2007), audio or video recordings (Hulsman, et al., 1999), and provider discussions on the psychosocial problems encountered in practice (Roter, et al., 1995) also contributes to more effective training. Effectiveness of training can also be enhanced by accentuating the relationship between communication skills and positive patient outcomes (Roter, et al., 1995).

Provider Communication May Also be Targeted Through Feedback and Decision Support Interventions

Research shows that trainings specific to enhancing communication skills are of use; however, it should also be noted that interventions to address provider communication patterns may also include feedback and decision support components. When providers engage with SMs in the interview, they are making decisions about what to say and how to say it, and some of these communication decision points may be amenable to improvement by the provision of information or reminders during the interview. While a clinical reminder to "empathize" is

unlikely to be of any use, Vanderbilt's previous study identified several concrete communication points upon which a decision support system might act. First, while most providers asked SMs a general question about their physical health regardless of whether any symptoms were listed on the self report form, far fewer asked a general question about mental health (Bickman, et al., 2009). Given that past research indicates that patients may find such conditions more difficult to discuss (Barney, Griffiths, Jorm, & Christensen, 2006), it is all the more important that the provider give the SM an opening to discuss these symptoms, even if they aren't reported on the self-report. Vanderbilt's previous research also found that SMs were more likely to accept referrals if the provider took the time to dispense educational information about the areas of concern during the interview (Bickman, et al., 2009); however, providers only offered such information to SMs 13.7% of the time for mental health conditions and 8.9% of the time for alcohol concerns. Even when the SM had endorsed a problem on the self report form, there was no area of mental or physical health concern for which providers offered education even half of the time (Bickman, et al., 2009). These findings illuminate potential communication decision points that are ideal targets for feedback or decision support interventions of the types that are discussed further below.

Feedback and Decision Support

Structure

Feedback is Most Effective When Provided on a Recurring Basis

The previous section of the literature review described structural and content elements of effective clinician training interventions, while noting that one-time training events may have limited effects on clinician behavior in the long term. Lasting provider behavior change is more likely to result from interventions which provide actionable information to providers on a regular basis, in the form of systematic feedback. Feedback interventions provide systematic information relevant to patient outcomes, a potentially powerful tool to change clinician behavior that has been successfully applied in improving outcomes in medicine (e.g.,(Davis, et al., 1999; Duncan, 2000). Such feedback may take a variety of forms, though in all cases it will communicate a provider's status in relation to a particular standard of care and will serve as a means for the recipients of feedback to identify and act upon areas in which they are in need of improvement (Veloski, et al., 2006). The standard that the feedback is designed to address may be derived from a variety of sources. In many cases, it may be a professional guideline, but feedback can also be provided on the basis of guidelines or statistical norms that are specifically relevant to the patient population that the providers routinely see. The feedback may also be delivered in a variety of ways, either to providers individually, or to groups of providers as units.

Longer, Professionally Administered Feedback Interventions Were More Effective

Well-designed feedback interventions are generally effective in improving provider behaviors. In one major review of 41 studies (Veloski, et al., 2006), 70% of feedback interventions were found to be successful, with chances of further improvement when certain design factors were incorporated. Providers may more readily accept feedback from colleagues or individuals who are normally part of their professional oversight system. Among studies in which this occurred,

83% were successful, as opposed to 50% when the feedback was given directly to providers from the research teams. This point informs Vanderbilt's decision to employ a "train the trainer" approach regarding the provision of feedback at regular meetings. Studies that are at least a year long also tend to be more effective than those of shorter duration (Veloski, et al., 2006). While the timeline for the proposed pilot is of short duration, positive findings for preliminary outcomes (e.g., feasibility, acceptability to providers) could indicate the need for a follow-up study of longer duration.

While feedback alone can serve as an effective means of improving provider behavior, additional benefits can result from multi-faceted interventions such as the one intended for Vanderbilt's research. Studies have been conducted in which feedback had been combined with some other intervention intended to influence behavior (Veloski, et al., 2006). These other interventions were divided into three groups: education and guideline provision; educational outreach visits; and "other" interventions. For studies in which the impact of education and feedback was examined, 63% reported a positive impact—slightly lower than the 70% reported for feedback-only studies. This suggests that simple training, in and of itself, does not necessarily add value over and above a more continuous provision of feedback. However, some evidence of value added was found for studies that examined the combination of feedback with educational outreach visits; in this subset, 75% of studies reported positive results. The "other" category included a wide variety of interventions, all of which were more intensive than the provision of up-front training or guidelines. Examples of methodologies used in this category include incorporation of algorithms, reminders, patient-mediated interventions, group consensus processes, and multiple other strategies. Among this admittedly heterogeneous group, 81% of studies reported positive effects (Veloski, et al., 2006). This is the highest rate of all subsets examined and provides some evidence that a multi-faceted approach is the most likely to produce positive changes in provider behavior.

Decision Support Can be Used to Provide Specific, Patient-tailored Information to Provider
The feedback described so far has been of a type that generally occurs weekly or monthly, although it can be provided according to any recurring cycle, including in real time. In a decision support system, information is provided to the clinician in real time (immediately prior to or during patient encounters), with the goal of improving clinical decision making. These are often computerized systems that match the characteristics of individual patients to a computerized knowledge base. Algorithms are then applied to generate recommendations that are specifically targeted to the patient (Garg, et al., 2005). Instead of spending a substantial amount of time interpreting multiple fields of information, the provider can process the information in a short, easy to read format. Patient information may be added to the system in several ways. Health care professionals or staff may enter the information themselves, or patients may do so—for example by filling out a computerized questionnaire about symptoms they are experiencing. Alternatively (or additionally), electronic medical records can be linked to the decision support system and then queried to retrieve patient characteristics (Garg, et al., 2005). The information from the computerized knowledge base then has the appropriate algorithms applied in order to generate recommendations to the provider. These recommendations may be delivered to the provider through the patient's electronic medical records, by pager, or via

printouts that can be placed in a patient's paper chart (Garg, et al., 2005).

Simple Clinical Reminders Can Improve Provider Behavior
The simplest decision support tools come in the form of clinical reminders, which are usually computerized popup screens that appear when a provider accesses medical information about a patient. Such reminders may "pop up" only after the system accesses information in the patient's medical records and screens it for an important risk factor, or they may appear as general reminders of recommended practices. The VA system currently uses a clinical reminder system as part of its protocol for identifying patients with continuing symptoms of traumatic brain injury. This system initially pulls very basic information from the patient's records; if the patient presenting had a military separation date that was after 9-11-01, the TBI Screening Clinical Reminder is activated, and clinicians are directed to determine whether the patient served in Operation Enduring Freedom (OEF) or Operation Iraqi Freedom (OIF). If not, no screen is needed, and the clinical reminder is satisfied for that patient encounter. If the patient did serve in one of these Operations, however, the provider administers the screening tool (Lew, 2007).

Although simple, this type of support at the time the provider makes a decision can have immense value over and above even effective weekly or monthly feedback provision. Nair et al. (2010) conducted a study with the aim of identifying the type of intervention that would result in the greatest improvements in physician behaviors regarding prophylactic antibiotic administration in surgical patients. The authors compared groups of physicians who were receiving one of the following types of support: standard patient anesthesia records that included no additional information; regular email feedback that informed providers of instances in which they had failed to produce appropriate documentation; monthly summary reports; and real time electronic alerts in the context of a computerized decision support system. Physicians receiving email alerts exhibited a 2.3% positive change in antibiotic compliance. Those who received summary reports improved behavior by 4.9% and those who received the electronic alerts for each patient improved behavior by 9.3%, thus achieved greater than 99% compliance with standard guidelines (Nair, et al., 2010). Thus, while regular feedback was beneficial, support at the time of decision added more value. Further, while this was a computerized reminder system, it is possible to employ clinical reminders in a paper-based fashion, particularly in settings like those typical of the PDHRA process. Later sections of this review will discuss the "decision support" clinical reminders that are already available to providers on the PDHRA form, and explore possible ways of creating a paper-based system which would make these elements more comprehensive.

More Intensive Decision Support Tools Apply More Complex Algorithms to Patient Information
More complex versions of decision support may begin with clinical reminders but then go on to facilitate provider decision making in more complex ways by feeding additional information from patient medical records into the decision support tool. These tools may apply algorithms that incorporate information from several fields and then generate a recommendation for the provider. For example, Kurian et al. (2009) reported on a decision support system that providers used to help guide treatment decisions for patients with depression. In this system,

patient symptoms, medication adherence data, and experience of medication side effects were components of an algorithm that was applied to generate medication recommendations to providers. Patients whose providers used the system reported significantly greater symptom reduction than did patients whose providers employed care as usual (Kurian, et al., 2009). Similar systems have resulted in positive provider behavior change in a variety of other areas, including antibiotic prescribing (Nair, et al., 2010), cardiac disease management (Santelices, et al., 2010; Toth-Pal, Wardh, Strender, & Nilsson, 2008), reduction in drug dose calculation time (Balaguer, Ballart, & Subias, 2001) and increasing rates of osteoporosis screening (Dejesus, et al., 2010).

While a computerized decision support system for the PDHRA process may not be feasible at this time, the PDHRA is a perfect example of a health care encounter for which this type of tool could be valuable. Providers conducting PDHRA interviews have a very limited amount of time in which to screen for a variety of physical and mental health encounters. In Vanderbilt's previous research, some providers noted that interviewers do not have access to valuable information on the Post-Deployment Health Assessment (PDHA) which could be useful in clarifying risk for certain conditions (e.g., combat exposure, previous self-reported problems) (Bickman, et al., 2009). Further, multiple scales are employed on the PDHRA, with no current algorithms in place to help providers assess risk in complex situations such as those in which a SM has no positive screens but scores just below the threshold for multiple conditions. A computerized decision support system might pull in relevant PDHA data, calculate individual subscale results automatically, and then report this information in a format that allowed providers to see all of it at once. Further support could be provided by the inclusion of additional evidence-based algorithms that providers could use to help decide whether a referral was appropriate.

Decision Support is Effective in Producing Provider Change

In recent years, several groups of researchers have conducted comprehensive reviews of studies that examined the effectiveness of clinical decision support systems. The largest review to date was conducted by Garg et al. (2005), who reviewed 97 studies that compared provider behavior when a decision support system was used to behavior of providers acting without these systems in place. Positive outcomes were reported in 64% of these studies, and these successful studies tended to share important features. Most importantly, improvements in behavior were more likely to occur when providers were automatically prompted to engage with the system, as opposed to situations in which users had to access the system themselves. Improvements occurred in 73% of the studies that included automatically activated systems compared to 47% of the studies in which providers had to engage the systems manually (Garg, et al., 2005).

There are at least three additional variables that are associated with decision support interventions that succeed in improving provider behaviors. These include the provision of recommendations rather than simple assessments; the provision of decision support at the actual time and location of decision making; and the delivery of the decision support through the use of a computerized system. One review found that 94% of studies that combined these

three factors with an automatically activated system reported positive results (Kawamoto, Houlihan, Balas, & Lobach, 2005).

Several other factors influence the chances that a decision support system will be successful by improving the likelihood that providers will willingly accept the modifications to their normal routines. Representatives from military installations have told Vanderbilt researchers that they don't want to be treated like robots (Bickman, et al., 2009), and indeed, measures to reassure providers that their professional autonomy is not threatened are essential to the development of a system that will not be resented (Moxey, et al., 2010). It can be helpful to have new systems endorsed by colleagues prior to implementation, and careful attention to interface design can ensure that the provider's ability to communicate with patients is not compromised (Moxey, et al., 2010). In fact, a system that efficiently organizes information that providers view as important may actually make it possible for providers to spend less time shuffling through papers looking for information and more time engaging with the patient.

Feedback and Decision Support Systems are Relevant to Military and VA Clinical Processes
A search of the literature did not reveal any intervention that examined the effectiveness of training, feedback, or decision support on improving provider behaviors during the PDHA or PDHRA. However, relevant studies have been conducted in the Veterans Affairs (VA) system and at military bases. It will be useful to describe these briefly for the purposes of showing that decision support systems can be implemented in these settings with positive results.

In the VA, the utility of a decision support system that encouraged providers to conduct brief interventions (BIs) with veterans who had screened positive on the AUDIT-C was assessed (Lapham, et al., 2010). Providers improved their behavior from baseline after they received basic education on this topic, but far greater improvements were achieved after the implementation of an electronic clinical reminder (Lapham, et al., 2010) The findings of this study are particularly applicable to the PDHRA process, as the reminder issued to providers is not the typical directive to conduct a screening, but a reminder to the provider about what should be done following the positive screen.

A more extensive computerized decision support system has been tested at military base practices, and has resulted in modest improvements in the administration of screening and preventive measures, though not in improvements in acute care processes (Apkon, et al., 2005). Further, while no research has been published on the incorporation of decision support into the PDHRA, one study has addressed relevant concerns in the context of the Pre-deployment Health Assessment (PreDHA) screening questionnaire. This study found that the self report form had low validity for certain items—in this case self-identification of SMs with previously diagnosed mental health disorders. The authors of the study conclude that an electronic decision support system that incorporated relevant information from electronic health records would facilitate the identification of SMs at high risk for mental health disorders in the pre-deployment period (Nevin, 2009). While the literature on decision support in military settings is limited, the information available suggests that such a system is feasible to

implement and likely to be effective, particularly if it targets provider behavior during screening events such as the PDHRA.

Content: Actionable Information to Inform Feedback Development for PDHRA Providers

Introduction

While development of appropriate structure and delivery is essential to the success of any feedback intervention, it is not useful in the absence of strong, actionable content. Relevant content could be derived from several areas, including published guidelines, Vanderbilt's own analysis of previous PDHRA data, and input from the project's Expert Panel. As noted in the body of the report, Vanderbilt has not yet received data for secondary analysis. However, the research team has reviewed preliminary findings from the previous research contract and also explored the literature relevant to five behavioral health symptom subscales of the PDHRA process: Posttraumatic stress disorder (PTSD), depression, relationship problems, Traumatic Brain Injury (TBI), and alcohol use.

For PTSD and depression, previous studies have validated the scales in forms identical or very similar to those that are used on the PDHRA. Consequently, the literature review for these two sections summarizes these studies, and comments upon important points relating to the sensitivity and specificity of the scales. Findings focus on sensitivity and specificity. The sensitivity of a model is its ability to identify those at risk, while specificity refers to a model's ability to identify those not at risk of the outcome. In general, sensitivity and specificity are measures that assess the validity of diagnostic and screening tests. Practically speaking, a highly sensitive assessment means one in which a large percentage of the population is classified correctly as having the disorder; a highly specific assessment is one in which individuals without the disorder in question are not incorrectly identified as having the disorder. An ideal screening assessment would be maximally sensitive and specific, with 100% of individuals at-risk being detected and 100% of those not truly at risk being ruled out. This framework is useful for evaluating decision rules or cut points for a measure because it accurately reflects how an increase on any one of these indices tends to co-occur with a decrease on another.

It was possible to report fairly extensively on sensitivity and specificity values for the PTSD and depression subscales. For the relationship, TBI, and alcohol subscales, however, peer-reviewed validation studies of the items as they appear on the PDHRA have not been published. Consequently, these sections of the literature review examine those scales more qualitatively. In all cases, the derivation of the scales, the recommended scoring procedures, and the expectations for documenting results on the provider portion of the PDHRA form are discussed. Finally, after the separate discussions of the five subscales, this review concludes with a more targeted discussion of ways in which a feedback intervention might help improve provider decision making in instances where SMs exhibit symptoms across multiple subscales.

PDHRA Subscales

The Post Traumatic Stress Disorder (PTSD) Subscale

The PTSD subscale as written in DD Form 2900 is taken verbatim from the well-validated Primary Care PTSD Screen (PC-PTSD) (see Prins & Oimette, 2004). Any study that conducted a

validation of the PC-PTSD subscale against a gold standard was included in this review. Nine such studies were found, though they were variable in regards to the quality of the gold standards used and the similarity of the study populations to the PDHRA population. This variability in study populations is smaller than it might be, however, because the PC-PTSD was developed in the VA primary care setting, and consequently almost all validation studies conducted on the scale have involved veteran or military populations. Table B.1 summarizes the methodologies used in each study along with basic findings, which are also discussed more generally in the paragraphs to follow.

All of the studies reviewed established that endorsement of either 2 out of 4 or 3 out of 4 symptoms should be considered a positive screen for PTSD if the goal is to achieve optimal balance of sensitivity and specificity. Most authors also acknowledged that either of these cutoffs could be appropriate depending on whether circumstances favored a need for greater sensitivity or specificity (Bliese, et al., 2005; Bliese, et al., 2008; Bliese, Wright, Adler, & Thomas, 2004; Calhoun, et al., 2010; Gore, Engel, Freed, Liu, & Armstrong, 2008; Prins & Ouimette, 2004). These scoring recommendations were based on assessments of the sensitivity and specificity values associated with the various possible scoring algorithms, the values of which varied substantially across studies. Reported sensitivities ranged from .45-.97 when 2/4 items were endorsed and .46- .91 when 3/4 were endorsed, while specificity ranged from .57-.96 when 2/4 items were endorsed and .72-.97 when 3/4 items were endorsed (See Table B.1 for values identified in individual studies) (Bliese, et al., 2005; Bliese, et al., 2008; Bliese, et al., 2004; Calhoun, et al., 2010; Gore, et al., 2008; Kimerling, Trafton, & Nguyen, 2006; Ouimette, Wade, Prins, & Schohn, 2008; Prins & Ouimette, 2004). For scoring of the PDHRA, recommendations released by USAMRU researchers suggest scoring a 2 as positive (Bliese, et al., 2008; Wright, Adler, Bliese, & Eckford, 2008), thus choosing to err on the side of sensitivity. This represents a change from earlier reported recommendations for identifying the cutoff point as 3 (Bliese, et al., 2004). In spite of the fact that these guidelines have been published, no scoring instructions are included on the actual DD 2900 form, and there is no place in the provider reporting area to specifically record the score of this screen as providers are expected to do for the alcohol and TBI subscales (*DD 2900 (PDHRA) - January 2008 Version*, 2008). It is unknown the extent to which providers are consistent in evaluating the four questions contained in this screening subscale.

Since the three studies by Bliese and colleagues are the only ones that were conducted among active SMs in a post-deployment context, some attention to these findings in relation to those of other authors may be useful here. These studies report specificity findings that are consistently high, especially when a positive score is defined as endorsement of 3/4 items (Bliese, et al., 2005; Bliese, et al., 2004; Bliese, et al., 2008). One possible explanation for this is the fact that the army study populations were made up of individuals taking a required, non-anonymous screening, the results of which could be reported to commanding officers. This context might result in a higher rate of participants underreporting mental health symptoms during the screenings—a circumstance which would increase specificity (Calhoun, et al., 2010). While the PDHRA cannot be made anonymous, improvements in provider communication

might help mitigate some of the concerns SMs have about reporting symptoms.

Table B.1 Summary of Sensitivity and Specificity Values for the PC-PTSD

Article	N	Study Population	Gold Standard	Sensitivity/ Specificity 2/4 Endorsed		Sensitivity/ Specificity 3/4 Endorsed	
Bliese et al., 2004	592	Active Service Post-deployment, Army	Adapted MINI	0.73	0.88	**0.46**	**0.97**
Bliese et al., 2005	367	Active Service Post-deployment, Army	Adapted MINI	**0.79**	**0.78**	0.55	0.92
Bliese et al., 2008	352	Active Service Post-deployment, Army	Adapted MINI	**0.85**	**0.76**	0.76	0.92
Calhoun et al., 2010	220	Recent Veterans who served since 9/11/2001	Structured Clinical Interview for DSM-IV Axis 1 disorders (SCID-1)	0.89	0.75	**0.83**	**0.85**
Gore et al., 2008	213	Patients at military primary care clinics in Washington DC Active Service (62%), Retired Military (18%), Family of Military(19%)	Structured clinical interview (unnamed)	**0.91**	**0.71**	0.79	0.85
Kimerling et al., 2006	97	Veterans being treated for substance abuse at VA center	Clinician Administered PTSD Scale (CAPS)	0.97	0.57	**0.91**	**0.80**
Ouimette et al., 2008	11,230	Veterans seeking primary care identified through records	ICD-9 (no interview)	**0.45**	**0.96**	No data	No data
Prins et al., 2004	188	VA General Med/VA women's health clinics	CAPS	**0.91**	**0.72**	0.78	0.87
Van Dam et al., 2010	142	Non-military/VA patients already in treatment for Substance Abuse Disorders (Netherlands)	SCID-I	**0.86**	**0.57**	0.67	0.72

Note: Bold font in sensitivity and specificity columns denotes the algorithm recommended by the study's authors.

The Depression Subscale

The depression screen used on the PDHRA comes from the Patient Health Questionnaire-2 (PHQ-2), which consists of the first two items of the PHQ-9 (Spitzer, Kroenke, & Williams, 1999). Responses are selected from a 4-item Likert Scale, so that each question may receive a score of 0 to 3 (Spitzer, et al., 1999).

The version of the PHQ-2 used on the PDHRA is very similar to the original instrument; however, unlike the PTSD screen, some differences from the original do exist. The original questions ask respondents about symptoms that have occurred in the past two weeks, while the PDHRA version asks about the past month. Otherwise, wording is verbatim, although the

PDHRA employs a unique scoring algorithm. Outside of PDHRA usage, it is usually recommended to score the two PHQ-2 questions additively, so that a total score of 3 (out of a possible 6) on the 2 questions is classified as positive (though some recommend a cutoff of 2) (Arroll, et al., 2010; Bliese, et al., 2005; Chen, et al., 2009; Corson, Gerrity, & Dobscha, 2004; Cutler, et al., 2007; Kroenke, Spitzer, & Williams, 2003; Lowe, Kroenke, & Grafe, 2005; Richardson, et al., 2010; Thombs, Ziegelstein, & Whooley, 2008)(See Table B.2 for the scoring rules favored in each study). The PDHRA algorithm is slightly different; the 4-point Likert scale is retained, but the scores from the two questions are not added. A positive screen is an endorsement of either (not both) of the two questions, and it is usually recommended to count a score of 2 or above as positive for each question. Consequently, any SM who scores at least a two on either item will screen positive (Wright, et al., 2008). In most cases, the two scoring algorithms should identify cases consistently. However, exceptions to this exist, as in the two examples provided below:

- *Example 1*: In traditional PHQ-2 scoring (when a positive score is a total of three or greater when the responses to the two questions are added), a person who scored a 2 on the first question and a 0 on the second question would have a total score of 2, and thus would screen negative. In contrast, according to PDHRA scoring recommendations, this would be a positive screen because one question reached the threshold of 2.

- *Example 2*: When traditional PHQ-2 additive scoring uses 2 as the cutoff, a person who scores 1 on both questions will screen positive by that algorithm, because he will have a total score of 2. On the PDHRA algorithm, he will screen negative, because he failed to reach the threshold of 2 on either independent question.

As with the PTSD subscale, there is no place on the provider portion of DD Form 2900 which actually contains scoring instructions, and there is no specific space for providers to document whether SMs screened positive or not (*DD 2900 (PDHRA) - January 2008 Version*, 2008).

The literature review identified nine studies that examined the validity of the PHQ-2. Because the PHQ-2, unlike the PTSD screen, was not originally a VA scale, a wide variety of populations were studied in the articles identified, including active service military, general practice patients in the U.S. and other developed countries, low-income and -education inner city populations, coronary patients, and populations in developing nations. Some studies in this review include more than one dataset or evaluate against more than one gold standard, so there are actually 13 datasets included (Table B.2 identifies the multiple datasets within studies). Of the studies identified, only Bliese et al.'s (2005) 3-sample study uses the scoring algorithm recommended for the PDHRA, while eight other studies used the original additive scoring method. Four of these studies use a previously validated structured interview as a gold standard, while several others used previously validated questionnaires as gold standards (This methodology is less rigorous, and so, while the studies were retained in the review, they are marked with an asterisk in the summary table at the end of this section). A summary of the sensitivity and specificity values determined for several subsets of reviewed studies is included below, while more detailed information is included in Table B.2, which follows:

1. PDHRA Algorithm (1 Study, 3 data sets): When the PDHRA algorithm is used, sensitivity ranges from .50 to .73 and specificity ranges from .86 to .95. Bliese et al. (2005) also report on using the same cutoff point, but requiring endorsement of both items. This scoring method was only assessed for one sample, but produced an unsatisfactory sensitivity of .31, and a specificity of .97. Therefore, all studies using this algorithm recommend a positive screen when one item is endorsed rather than two.
2. Original PHQ-2 Scoring Algorithm with any Gold Standard (8 Studies, 13 data sets): All studies which used an algorithm requiring addition between the two question scores recommend a cutoff of either 2 or 3. With a cutoff of 2 studies reported sensitivities ranging from .78 to 1.0 and specificity from .51 to .89. With a cutoff of ≥3 sensitivity ranged from .25 to .97 and specificity ranged from .78 to 1.0. (The .25 figure was for a data subset of mothers with high school education or less, which the authors cited as evidence that this algorithm with this screen may not work as well in low education populations. Sensitivity was .44 for the whole sample and .86 for more educated mothers).
3. Original PHQ-2 Scoring Algorithm with Structured Clinical Interview Gold Standard (4 studies, 4 data sets):
   Not all of the studies listed above used a structured clinical interview as a gold standard. Among the four studies where structured clinical interviews were used, all recommended a cutoff of 3 (with acknowledgement that in some situations 2 may be better). With a cutoff of 2, sensitivity ranged from .90 to 1.0 and specificity ranged from .51 to .74. With a cutoff of 3, sensitivity ranges from .74 to .87 and specificity from .75 to .90.

It is encouraging to review the diversity of these studies and to note that acceptable values for sensitivity and specificity were found when the screen was used on a wide variety of patient types, including active service military, veterans, adolescents, and OB/GYN patients (Bliese, et al., 2005; Corson, et al., 2004; Kroenke, et al., 2003; Richardson, et al., 2010). The scale was also found to be valid in multiple countries (Arroll, et al., 2010; Chen, et al., 2009; Lowe, et al., 2005), and ethnicity did not influence effectiveness (Cutler, et al., 2007). One study did find that the screen was less sensitive for women with a high school education or less than it was for women with some college, and it is worth noting that education may influence the screen's effectiveness (Cutler, et al., 2007). However, this may not be a major factor in the military population, in which gender is predominantly male and all individuals have received some form of post-high school training even if they have not attended college.

Table B.2 Summary of Sensitivity and Specificity Values for the PHQ-2

Article	N	Study Population	Scoring Method	Gold Standard	Positive Score	Sensitivity	Specificity
Arrol et al., 2010	2642	Adult Primary Care Patients, New Zealand	Original PHQ	*CIDI	2	**0.86**	**0.78**
					3	0.61	0.92
Bliese et al., 2005	367	Active Service Post-deployment, Army	PDHRA	Adapted MINI	**Either item endorsed**	**0.73**	**0.86**
					Both items endorsed	0.31	0.97
Bliese et al., 2005	592	Active Service Post	PDHRA	Adapted MINI	**Either item endorsed**	**0.5**	**0.95**
Bliese et al., 2005	356	Active Service Post	PDHRA	Adapted MINI	**Either item endorsed**	**0.65**	**0.89**
Chen et al., 2009	364	Primary Care Patients aged 60 or over in China.	Original PHQ	SCID	2	0.90	0.66
					3	**0.84**	**0.9**
Corson et al., 2004	1211	Veterans at VA primary care clinics.	Original PHQ	*PHQ scoring ≥ 10 as +	**2**	**0.95**	**0.89**
					3	0.76	0.95
Cutler et al., 2007	94	Low Income Urban Mothers	Original PHQ	*PHQ scoring ≥ 15 as +	**2**	**0.99**	**0.79**
					3	0.93	0.86
				*The Major Depression Algorithm	**2**	**1.00**	**0.81**
					3	0.97	0.91
				*Edinburgh Postnatal Depression Scale (EPDS)	2 (All Participants)	0.78	0.87
					3 (All Participants)	0.44	0.97
Kroenke et al., 2003	580	Adult primary care patients and adult OB/GYN patients	Original PHQ	Structured clinical interview adapted from SCID and PRIME-MD	3 (Mother ≤HS Ed)	0.25	0.95
					3 (Mother ≥ Some College)	0.86	1.00
					2	.93	.74
					3	**.83**	**.90**
Lowe et al., 2005	520	German Outpatients at outpatient clinics and family practices	Original PHQ	SCID	2	1.00	0.51
					3	**0.87**	**0.78**
Richardson et al., 2010	444	Adolescents	Original PHQ	*PHQ-9	2	1.00	0.62
					3	0.96	0.82
Thombs et al., 2008	1024	Outpatients with coronary artery disease	Original PHQ	DISC-IV Interview	2	0.9	0.57
					3	0.74	0.75
				*C-DIS	**2**	**0.82**	**0.79**
					3	0.39	0.93

**Denotes a gold standard that is not a structured clinical interview.*

Note: Bold in the Algorithm column denotes the algorithm recommended by the study's authors.

The Relationship Problems Subscale

The relationship problems screen in the PDHRA consists of a single item in which SMs are asked to answer "yes," "no," or "unsure" to the question "since return from your deployment, have you had serious conflicts with your spouse, family members, close friends, or at work that continue to cause you worry or concern?" A careful review of the literature revealed that neither this screen nor any similar single item screen for relationship problems has been previously validated in a peer-reviewed publication. However, one non-peer reviewed report did assess validity of the PDHRA item for a post-deployment sample of active service army personnel (Bliese, et al., 2005). The main question to be addressed when scoring the relationship question is whether to interpret answers of "unsure" as positive or negative screens. Bliese et al. (2005) determined sensitivity and specificity values for both ways of scoring this item. They found that when "unsure" was scored as "no," sensitivity was .58 and specificity was .88. When "unsure" was scored as "yes," sensitivity was .68 and specificity was .81. Sensitivity was lower among married SMs, suggesting that the screen may miss more relationship problems in this group. However, for both groups, the best balance of sensitivity and specificity could be achieved by scoring "unsure" responses as positive (Bliese, et al., 2005). This is the algorithm currently recommended for scoring the PDHRA (Wright, et al., 2008). As with the two previously reviewed subscales, the PDHRA form does not include these instructions, nor does it include a place for providers to record the score on the provider documentation page (*DD 2900 (PDHRA) - January 2008 Version*, 2008).

The Traumatic Brain Injury (TBI) Subscale

The PDHRA TBI scale is identical in content to a four-item TBI screening instrument that was implemented in the VA system in 2007. This scale, in turn, is based on the three item Brief Traumatic Brain Injury Screen (BTIS) developed specifically for active duty military personnel and validated by the Defense and Veterans brain Injury Center (Carlson, et al., 2010; GAO, 2008) The VA TBI screen roughly corresponds to the BTIS screen, but with the addition of one item; while the BTIS only asks about symptoms that occurred immediately after the injury and at the time of the screening, the VA scale asks about these time points in addition to asking about problems that began or got worse after the injury event. The wording of the three VA/PDHRA instrument items that correspond to the BTIS items is similar, but not identical to, the BTIS.

In VA settings, a positive screen on the four item instrument is coded when the veteran endorses at least one item within each of four sections. Veterans with affirmative responses to the first two sections but negative responses to the third and fourth sections are not systematically referred for a follow-up evaluation for TBI, since post-deployment screening aims to find continuing problems rather than problems that resolved earlier (Carlson, et al., 2010). Although the PDHRA is administered to active duty SMs, the context is similar to that of the VA in that SMs reporting for screening will almost certainly be at least three months removed from any deployment-related head injury events. Recommended PDHRA scoring is similar to that which is recommended in the VA setting, with instructional notes on the provider portion of the form indicating that a positive screen for potential TBI with persistent symptoms should be coded based on responses to the last item, which asks SMs to report symptoms experienced

within the past week. The provider form also includes a space to specifically record the results for this screen, in contrast to the lack of documentation expected for the PTSD, depression, and relationship screens (*DD 2900 (PDHRA) - January 2008 Version*, 2008).

The literature contains no study validating this scale, either as it is applied in the PDHRA process or in its use as a VA screening tool. The scale's validity in the VA system is currently being investigated, through no results of this study can be expected before December 2011 (Babcock-Parziale, 2009). Some validation of the BTBIS screen has been conducted, though it has not been extensive. No sensitivity or specificity data are available for BTBIS, and the only indicator of validity available in the published literature is a study by Schwab et al. (2007), which found that the prevalence of having three or more postconcussive syndrome symptoms was higher (at 74%) among SMs who reported recent symptoms on the third BTBIS question than it was for those who did not report problems (at 40%). This lack of validation for TBI screening instruments in the military has led to concern about misdiagnosis among some military providers and researchers (Hoge, et al., 2009).

The Alcohol Use Subscale

The alcohol screen used on the PDHRA consists of one 5-part question (q13a-e), of which the first two items are derived from the Two Item Conjoint Screen for Alcohol and Other Drug Problems (TICS) (Brown, Leonard, Saunders, & Papasouliotis, 2001), and the last three are the questions that make up the AUDIT-C (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). The PDHRA form of the AUDIT-C is consistent with other versions of the instrument in common use, but there are two important differences between Brown et al.'s (2001) original TICS scale and the PDHRA version. First, questions in the TICS scale ask respondents about their behaviors over the course of the past year, while the PDHRA asks about the past month, a change that was made to account for the fact that SM drinking patterns usually differed from the present during deployment (Wright, et al., 2008). The second way in which the PDHRA screen was changed from the original is that both questions were altered to ask only about alcohol as opposed to encompassing both alcohol and drug use.

Each of these instruments has been validated independently, though no validation study has examined the use of the two scales in combination. Brown et al. (2001) found sensitivity and specificity values of .70 and .78, respectively for the TICS, noting that because the instrument asked about drug or alcohol use without requiring the respondent to specify which one they consumed, it was possible that sensitivity might be lowered for detection of alcohol problems, if problem drinkers feared that a positive response would cause people to believe that they used illegal drugs (Brown, et al., 2001). The questions used on the PDHRA make reference to alcohol only, so if this were indeed a factor, the effects might be mitigated by this approach; however, no literature identified in this review validated the modified TICS used on the PDHRA.

The AUDIT-C has been validated in multiple studies conducted both in VA and in other populations, with sensitivity scores ranging from .81 to .95 and specificity ranging from.69 to .86 for population samples including both men and women (Bradley, et al., 2003; Bush, et al., 1998; Gordon, et al., 2001). At least one study has shown that using a cutoff point of 3 for

women, as is standard in PDHRA scoring is necessary to achieve acceptable validity of the AUDIT-C for women (Dawson, Grant, Stinson, & Zhou, 2005). There is also evidence that AUDIT-C scales supplemented by one or two additional questions may be more valid (Bradley, et al., 2004; Kriston, et al., 2008), though it is impossible to say whether this is true of the combination of AUDIT-C and TICS. Further, in previous studies that examined slightly expanded AUDIT-C instruments, the new questions were incorporated into the AUDIT-C scoring algorithm. On the PDHRA, the two scales are scored separately, and a positive screen is indicated when an SM has a total score of 4 (3 for women) on the AUDIT-C component (13c-e) or an endorsement of "yes" for either question 13a or 13b. These directions are specifically provided to the interviewer on the form, along with a space where the result of the screen is specifically recorded (*DD 2900 (PDHRA) - January 2008 Version*, 2008).

Comorbidity and Cross-Scale Screening Issues

The review above shows that the PDHRA form contains only limited guidance on whether to favor sensitivity or specificity when interpreting individual scales. However, no guidance at all is included to help providers interpret the results of multiple scales in relation to one another. Some have argued that favoring specificity may not reduce recognition of comorbidities, an assertion based on the idea that as long as an SM screens positive on one scale, the provider will be alerted to look for additional problems during the interview (Bliese, et al., 2005). Others have provided evidence to the contrary. For example, in one VA clinic, 25% of substance abuse disorder patients were found to have previously undiagnosed PTSD in spite of the fact that they had already been screened and interviewed for mental health concerns (Kimerling, et al., 2006). High rates of previously unidentified comorbidities have also been reported among patients diagnosed with TBI (Carlson, et al., 2010). These findings indicate that clinical interviews do not always succeed in identifying multiple mental health concerns. Further, comorbidities continue to be missed even after patients have entered treatment for other problems. PDHRA providers should not make the mistake of assuming that as long as they refer a patient for one condition, other providers will identify any problems that they missed. Effective feedback that increases the accuracy of the PDHRA interview has the potential to increase the chances that providers will make appropriate referrals and that SMs will be able to access appropriate care.

APPENDIX C: STUDY DESIGN PRESENTATION TO FHP&R AND DCOE

Improving Deployment-Related Primary Care Provider Assessments of PTSD and Mental Health Conditions

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March 3, 2010

1

Presentation Goals

- Previous Research
- Current Proposal: Goals, Aims, and Methods
  - Purdue Subcontract
- Study Timeline
- Potential Modification to Study Design and Timeline

2

Previous Research

- NOV 2007 – DEC 2009, VU conducted a program evaluation to assess how the PDHA and PDHRA contribute to increasing Service Member (SM) access to appropriate care
- CEPI background in program evaluation research and specifically, training and feedback interventions to change clinician behavior

3

Previous Research: Evaluation Design

- Multiple methods and data sources
  - PDHA, PDHRA, and health care records
  - SM survey
  - Quasi-experimental study of effect of SM education
  - Qualitative interviews with key stakeholders in PDHRA process
  - Observations at 10 different installations
  - Content analysis of audio-recorded PDHRA interviews

4

Previous Research: Key Relevant Findings

- Clinician interview adds value to increasing medical referrals, but this contribution is relatively small compared to the contribution of SM self-reported problems
- Clinical interview focuses on SM self-reported problems and misses problems for SMs who do not already disclose them on PDHRA self-report. The interview does little to increase sensitivity
- Significant minority of SMs admit to underreporting behavioral health problems on the PDHRA
- Low reliability in clinician interviews across multiple PDHRAs for same deployment, despite high consistency for SMs' self-report
- PDHRA-specific communication about behavioral health issues occurs less than for physical issues
- Clinicians do not use empathy statements
- Reported lack of systematic and intensive clinician training specific to PDHRA

5

Key Relevant Recommendations From Previous Research

- Establish quality assurance procedures for the clinician interview
  - Ensure providers ask about all potential health problems, even those not endorsed, and especially behavior health issues
  - Providing education
- Establish clinician guidelines for a more structured and systematic PDHRA interview
  - Increase reliability of clinician screening
- Require all interviewers to have successfully completed PDHRA-specific training
  - Increased normalization of behavioral health issues upon return from deployment
  - How to minimize under-reporting
  - How to deal with the alcohol questions
- Provide clinicians with monitoring and feedback about their performance on the PDHRA to ensure ongoing quality improvement

6

Current Proposal

- Funded by US Army Medical Research Acquisition Activity (USAMRAA)
- Government sponsor is FHP&R, with LCDR Nicole Frazer and Dr. Mark Paris as co-investigators
- SEP 2009 – SEP 2011 with option for one year extension

7

Purpose

- To develop and test the effectiveness of a targeted training and feedback intervention designed to help providers increase SM reports of behavioral health concerns and SM acceptance of a referral for further assessment where warranted.

8

Study Design

- Aim 1: Determine key elements of and current impact of training programs for deployment related assessments
  - Expert Panel review of 2007-2009 collaboration between VU and FHP&R to determine criteria for clinical competency
  - Focus groups with key stakeholders involved in the PDHRA process
  - Secondary analysis of PDHRA data from a specifically developed database that includes provider and MTF identifiers

9

Study Design

- Aim 2: Evaluate the effectiveness of a targeted training and feedback program on primary care providers' interview and clinical communication patterns related to SM behavioral health condition identification and referrals
  - Based on findings from Aim 1
  - Clinicians randomly assigned to one of two experimental groups (1) training and ongoing feedback, (2) training only, or to a control group to receive whatever training they would typically receive
  - 39 PDHRA clinicians at 4-6 MTFs
- Implementation will be measured through training attendance records, evaluations completed by the providers, and review of taped simulated interviews as a formative assessment
- Outcome measurement will include pre-and post-training content analysis of communication style from audiotapes and an analysis of secondary data

10

Risk Factors Associated with the Development of PTSD - Purdue Subcontract

- Primary focus - identify risk and resiliency factors associated with the development of PTSD.
- Secondary focus - assess the correspondence between initial self-report and primary-care provider assessments of trauma-related symptomatology on the PDHA and PDHRA and subsequent diagnosis for PTSD.

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Potential Risk Factors

- Individual-level factors
  - Marital/family status
  - Age
  - Pre-existing medical/mental health conditions
- Service-related factors
  - Branch
  - Rank
  - Time in service
  - Pay grade
- Deployment-specific factors
  - Number of deployments
  - Total time deployed
  - Length of time for each deployment
  - Dwell time between deployments
  - Frequency/intensity of combat exposure

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Identifying Risk and Resiliency Factors Associated with PTSD

- Analysis of records from AFHSC (subset of VU data set) and VHA
- Observational, retrospective case-control design
- "Cases" will be defined as SMs who, after first deployment, met the current criteria for confirmed PTSD (at least one in-patient encounter or two outpatient encounters with a diagnostic code indicating PTSD (ICD=309.81)) between March 2005 and December 2008.
- "Controls" will be selected randomly and will be matched to cases on gender, service component, military occupational specialty, and will have been deployed in the 6 mo prior to the case's PTSD diagnosis

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Concordance Study

- Concordance between SM self-reported problems, provider-reported concerns, and referral characteristics
- Concordance between PDHRA and subsequent health care utilization (including VHA utilization)

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Study Timeline

- First year (SEP 2009 – SEP 2010)
  - Secondary analysis of PDHRA data including provider and MTF identifiers and review of findings from previous collaboration
  - Focus groups
  - Develop feedback and training intervention
  - Site recruitment
- Second year (SEP 2010 – SEP 2011)
  - Implement the training and feedback program and evaluate the effectiveness and feasibility of the intervention
- Outcomes include implementation fidelity and quality, content analysis of communication style from interview audiotapes, secondary analysis of the PDHRA form and SM health care utilization, and SM satisfaction surveys.

15

Recent NDAA Legislation

- HR 2647 Sec 708
  - Requires person-to-person mental health assessments for SMs deployed with a contingency operation
  - Assessments will occur 60 days pre-deployment, and at 3-6 mo, 12 mo, and 24 months post-deployment
  - Clinicians must be *trained* and *certified* to conduct the assessments
- Timeline
  - 26 APR 2010 - Guidance to be issued to the Services
  - 21 JAN 2011 - Initial report to Congress on implementation
  - 26 APR 2012 – report to Congress on implementation, including "an evidence-based assessment of the effectiveness of the mental health assessments…" (HR 2647, pg 189)

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Proposed Modifications to Study Design

- Prioritize development of a clinician training program to inform the guidance consistent with implementation of NDAA legislation
- Now – April 2010: Using evidence to inform guidance
  - Review of existing programs and methods by content experts (behavioral health), context experts (military), and program evaluation/feedback experts (VU)
  - Gather data on existing identified 'best practice' training and/or monitoring programs for PDHRA clinicians
  - Further develop concrete recommendations from existing data relevant to behavioral health assessment and clinician training
  - Recommend guidance include stipulations for (1) a randomized controlled study and (2) training and ongoing feedback model
  - Identify expert panel and key stakeholders

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Proposed Modifications to Study Design

- April – October 2010: Development
  - Training materials and protocols
  - Evaluation design
  - Approvals process
- October 2010 – January 2011: Formative evaluation and report
- January 2011 – April 2012: Summative evaluation and report

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APPENDIX D: RESEARCH AND INTERVENTION DESIGN PRESENTATION TO EXPERT PANEL

Improving Deployment-Related Primary Care Provider Assessments of Behavioral Health Conditions

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July 21, 2010

1

Presentation Goals

- Establishing the need for provider training
  - Describe current study partnership and objectives
  - Review purpose and goals of PDHRA interview
  - Review key findings of previous PDHRA evaluation
- Importance of feedback in improving performance
- Proposed Training and Feedback Program: 3 components
  1. Initial training
  2. Decision support during interview
  3. Aggregated feedback on a weekly basis
- *Engage Expert Panel guidance and determine next steps for development*

2

Current Study

- VU/FHP&R partnership
- Cooperative agreement funded by US Army Medical Research Acquisition Activity (USAMRAA)
- Purpose: Develop and pilot a demonstration of a targeted training and feedback program to enhance health care providers' clinical communication practices and identification of SM behavioral health problems warranting further evaluation
  - Focus: PDHRA interview
  - Problem areas: PTSD, depression, relationship conflict, alcohol use, TBI
  - Objectives
    1. Analyze data using predictive modeling to develop feedback elements
    2. Implement pilot program and study outcomes related to feasibility and effectiveness
- Timeline: SEP 2009 – SEP 2011 with option for one year extension

3

Goals of the PDHRA*

- PDHRA purpose: Population-based screening for deployment-related physical and behavioral health concerns
  - To increase SM access to appropriate care for SMs in need of evaluation
  - To document deployment-related concerns in all SMs' medical records (PDHRA encounter coded as V70.5)
- Specific goals of the PDHRA provider interview
  - Clarify and confirm SM responses on the DD Form 2900
  - Educate SMs about concerns, healthcare, and treatment options
  - Conduct a risk assessment
  - Make referrals for further evaluation where warranted

*According to HA Policy 05-011 (10 Mar 05) and current information available on www.pdhealth.mil (e.g., http://www.pdhealth.mil/dcs/downloads/PDHRABackground_Paper4_9Jan06_03_22_06.pdf)

4

Our Previous PDHRA Evaluation

- Collaboration with FHP&R to conduct a two-year evaluation of the PDHA/PDHRA process encompassing all Branches and Components of the military (Sep 07 – Dec 09)
- This project evaluated if the PDHRA process increased SM access to appropriate care
  - Components: self-report → provider interview → health care utilization
  - Process
    - Relationship to PDHA
    - Characteristics of setting, interview, SMs

5

Previous PDHRA Evaluation: Methods

- Multiple methods and data sources
- Major components
  - Analysis of PDHA (n=300k), PDHRA (n=251k), and health care utilization (n=2.1M) for SMs between 01-JAN-06 and 31-MAR-09. Included all Branches and Components
  - SM survey (n=6,714) to identify SM-related factors that may influence the PDHRA process and satisfaction with the process
  - Quasi-experimental study (n=766) to examine the effects of Battlemind II on SM reporting and referral acceptance

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Previous PDHRA Evaluation: Methods (cont)

- Major components (cont)
  - Semi-structured interviews with 100 key participants in the PDHRA process and observations of PDHRA process at 10 installations
  - Content analysis of audio recordings of 272 PDHRA provider interview calls (Reserve component only)
  - Analysis of PDHRA context (e.g., in-person v. telephone interview) using 52,556 records provided by contracting agency for PDHRAS completed between February 2008 and March 2009 (Reserve component only)

Key Evaluation Findings: SM factors

- SM PDHRA self-report: *PDHA provides valuable information*
  - PDHA responses strongly predict PDHRA responses
    - Especially for TBI (OR=21.6), PTSD (OR=7.7), and depressive symptoms (OR=8.0)
    - Intervening health care encounters did not influence PDHRA reporting
  - SMs who reported combat exposure on PDHA twice as likely to endorse problems on PDHRA

8

Key Evaluation Findings: SM factors

- SM Survey: *Barriers to reporting behavioral health problems*
  - Significant minority (10-14%) of SMs admit to underreporting physical, emotional, or alcohol use problems on the PDHRA
  - 34% of SMs anonymously reported experiencing behavioral health problems since deployment
    - Negative attitudes toward help-seeking and accepting mental health treatment
    - Almost half (43%) reported no such problems on PDHRA

Key Research Findings: Provider Factors

- The interview does little to increase sensitivity, focusing on SM self-reported problems and missing non-disclosed problems.
  - Providers reported using positive responses from SM self-report to guide interviews
  - Number of major concerns and presence of a medical referral was compared for two groups of SMs: (1) Non- Disclosers - reported behavioral health problems on SM survey, but not on PDHRA (n=282); (2) Disclosers - reported behavioral health problems on SM survey and on PDHRA (n=380)
    - Average number of provider major concerns five times lower for non-disclosers (mean = 0.11) compared to disclosers (mean = 0.53)
    - Receipt of at least one medical referral almost three times lower for non-disclosers (mean = 0.14) compared to disclosers (mean = 0.67)

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Key Research Findings: Provider Factors

- PDHRA-specific communication about behavioral health issues occurs less than for physical issues
  1. Less mention of behavioral health problem areas
     - Physical health mentioned regardless of SM endorsement (87% v 84%)
     - Behavioral topics mentioned more when SM endorsed (64%) than not endorsed (35%)
  2. Little provision of education
     - Education related to mental health issues in 14% of all calls
     - Increased to 24% in calls where a medical referral was given
  3. Prior treatment discussed less for behavioral health and exposure problems
     - Physical health or TBI problems (87% to 92%)
     - Alcohol, mental health, or exposure (3.1% to 63.6%)
- Lack of use of best provider communication strategies to elicit more self-disclosure (e.g., empathic statements)

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Behavioral Health Problems are Common

- PDHRA self-report by SMs
  - 24% one or more symptoms of PTSD
  - 10% one or more symptoms of depression
  - 13% single item on relationship conflict
  - Rates are similar to SM reports of other types of problems
    - 29% one or more physical health symptoms
    - 25% one or more exposure concerns
    - 14% one or more TBI symptoms
- According to published studies, the presence of PTSD symptoms or diagnosis in OIF/OEF veterans ranges from 5-20% depending on the measure and criteria used for evaluation *(Hoge et al., 2004; Hoge et al., 2006; Seal et al., 2007; Seal et al., 2009; Milliken et al., 2007; Tanelian & Jaycox, 2008)*

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Recent News Stories Highlight Concerns about TBI and Behavioral Health Problems

- TBI is the issue in a recent (Jun 9, 2010) news story by NPR and ProPublica, ***Top Officer Says Military Takes Brain Injuries 'Extremely Seriously'*** [1]
  - "Official military statistics say 115,000 troops have suffered a mild traumatic brain injury since the wars began. But in interviews, top Army medical officials acknowledged that those figures understate the true number."
- A recent PressTV article (May 18, 2010) is titled ***'Mental Disorders Climb in US Military'*** [2]
  - "For the first time, more US soldiers are hospitalized for serious mental disorders from their military service than for injuries and battlefield wounds, according to new medical data released by the Pentagon. In 2009, there were 17,538 US soldiers put into hospitals for mental health problems compared to 17,354 for battle wounds and injuries sustained during military service."

[1] http://www.propublica.org/article/top-officer-says-military-takes-brain-injuries-extremely-seriously
[2] http://www.presstv.ir/pop/Print/?id=126861

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Recommendations for Providers

- Provide individualized information on risk factors from PDHA
- Improve consistency of interview and documentation
- Increase communication about behavioral health
- Use best strategies to increase self-disclosure

Accomplished Through Feedback and Training

15

Our Previous Experience Developing and Implementing Feedback Systems

Contextualized Feedback System (CFS): A Systematic Monitoring and Feedback Practice Improvement Tool

16

Strong Support for Feedback Concept

- Practice without feedback does not lead to improvement
- Measurement and feedback are at the core of all management and learning theories
- Thousands of studies outside of health/mental health show that improvement is minimal without measuring performance and providing feedback
- Decision support and feedback show promise in changing provider behavior, increasing access to specialized care, and improving outcomes in health/mental health care

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Improving Performance Through Feedback

- Basis in continuous quality improvement (CQI)
- Feedback cycle
  - GENERAL: input → decision → action → was that action correct?
  - PDHRA: self-report & interaction → need for further evaluation? → referral → was referral warranted?
- Effective feedback is
  - Timely and frequent
  - Targeted to purpose of action
  - Actionable
  - Easy to use and integrated into clinical practice
- Ambiguous input → variability in interpretation

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CFS in Use

- In mental health care
  - Initial development and testing (NIMH R01 8/04-4/10)
    - Treatment as usual in over 38 sites across the country with over 300 providers
    - Evidence of effectiveness in changing provider behavior and client outcomes
  - Revised software and support package (AHRQ 7/09-6/12)
    - Focus on feasibility in state mental health system
    - Increased emphasis on pre- and post-implementation support
  - Paired with evidence-based treatment (NIMH R01 7/10-6/15)
    - Increased emphasis on decision support
    - Testing increased effectiveness of feedback on evidence-based treatment
- In education
  - Initial development and testing (IES 3/07-2/11)
    - Teacher feedback to improve principal performance
    - CFS implemented at 72 schools, over 2000 teachers
  - Grant proposal for replication

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CFS General Development Process

- Basis in theory (individual and organizational) and infrastructure (software)
- Collaborate with setting and content experts to determine what and how to feedback to providers
- Comprehensive support for implementation to promote integration of feedback
- Attention to actionable feedback through provision of training and coaching

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Proposed Training and Feedback Program for PDHRA Providers

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Challenge: PDHRA is Unique Medical Encounter

- Brief (typically < 10 minutes)
- One-time encounter designed to screen, not diagnose
- Variability in site-based resources and rules for referral (formal or informal)
- PDHRA isolated from other relevant information (PDHA, deployment history)
- SM participation is required
- Stigma of reporting behavioral health concerns
- Limited and untested PDHRA-specific training (see-observed-do); variability among providers
- Lack of guidelines for interpreting self-report data (exception of AUDIT, TBI)
- HCPs may have general skills and training, but are being asked to conduct a specific type of screening

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Program Purpose

- Overall goals
  - Improve *consistency* of provider evaluation (i.e., provide guidelines for interpreting the PDHRA self-report)
  - Enhance *sensitivity* to behavioral health issues
- Our program will…
  - Work within the current process without substantially altering the purpose or time frame of the interview
  - Allow providers to focus on the SM rather than interpreting the self-report
  - Adapt according to implementation of NDAA Sec. 708
- Our program will not…
  - Follow-up on individual SMs to evaluate the appropriateness of referrals or effectiveness of care. Ultimately, looking at effectiveness of care would be ideal, but it is outside the scope of this study.

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Three Components

- Overview
  1. Brief training specific to PDHRA
  2. Decision support for interpretation of SM self-report and other relevant information
  3. Feedback to monitor performance and target areas for improvement
- Tailored to PDHRA process to enhance feasibility
  - Brief
  - Designed for one-time contact
  - Incorporated into interviews and weekly staffings

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Component 1: Initial Training

- **Format**
  - Live or webinar (est. 2-4 hours)
  - Combination of didactic teaching with case examples and vignettes
- **Content/Learning Objectives**
  - Communication training
    - Start by asking about any concerns (physical and BH) regardless of self-report
    - Evaluate previous treatment where problems reported
    - Strategies to elicit self-disclosure
  - Education for SMs
    - Effective statements to normalize post-deployment problems
    - Information on effectiveness and availability of health care and treatment options
  - Documentation guidelines/compliance rules
    - When to use open ended fields (SM just documenting problems but no concerns; previous treatment adequate thus no concern; SM reported problems not on self-report; etc.)
    - Document previous treatment
    - What is a major concern/minor concern
  - Decision Rules (i.e., rules for considering a positive screen)
- **Will adapt based on implementation of NDAA Sec. 708**

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Component 2: Decision Support

- Decision support ~ est. 0-2 minutes for most SMs, up to 5 minutes for SMs with many symptoms
  - SM specific information provided during PDHRA interview
  - Targeted to action: determining likely need for referral
  - Individualized to the SM's self-report responses
- Simple 'dashboard' of pertinent information easily available and already interpreted (example on next slide)
  - Relevant PDHA data (e.g., combat exposure, deployments)
  - Interpretive summary of current PDHRA self-report
    - Algorithms by subscale
    - Enhanced risk based on multiple subscales; SM factors
- Decreases need for interpretation of data so provider can focus on interaction
  - Match between self-report, risk factors and SM presentation?
  - SM just documenting concerns?
  - Adequacy of previous treatment where there are concerns?

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Electronic System or Paper

- Benefits of computer-based system
  - Automatic recording of provider viewing of decision-support and feedback for implementation tracking
  - Possibility of adding simple questions for research purposes (e.g., rating of SM level of disclosure during interview)
- Could provide algorithms for decision-support on paper
  - Requires provider hand completion
  - Likely decreased fidelity and increased burden

Decision Support Algorithm: Example

Providers, please refer to the PDHRA to complete the following questions.

		Referral Recommended
1.	Did the SM endorse any TBI symptoms in the past week (Q 9d)? [1]	(YES) NO
2.	Did the SM endorse "yes" or "unsure" regarding relationship conflicts (Q 11)? [2]	YES (NO)
3.	Were at least 2 PTSD symptoms (Q 12) endorsed on the PDHRA by this SM? [3]	(YES) NO
4.	Was at least 1 depression symptom (Q 14) endorsed "more than half the days" or "nearly every day" on the PDHRA by this SM? [2]	(YES) NO

1 Air Force. (2008). *Post-deployment health reassessment: Application user's guide.* Retrieved October 5, 2008 from Deployment Health Clinical Center: http://www.pdhealth.mil/dcs/downloads/PDHRA_AUG.pdf
2 Bliese, P., Wright, K., Adler, A., Hoge, C., & Prayner, R. (2005). *Post-deployment psychological screening: Interpreting and scoring DD form 2900.* Heidelberg, Germany: US Army Medical Research Unit-Europe. Research Report 2005-003.
3 Bliese, P., Wright, K., Adler, A., Cabrera, O., & Hoge, C. (2008). Validating the Primary Care Post Traumatic Stress Disorder Screen and the post traumatic stress disorder checklist with soldiers returning from combat. *Journal of Consulting and Clinical Psychology.* 76:2, 272-81.

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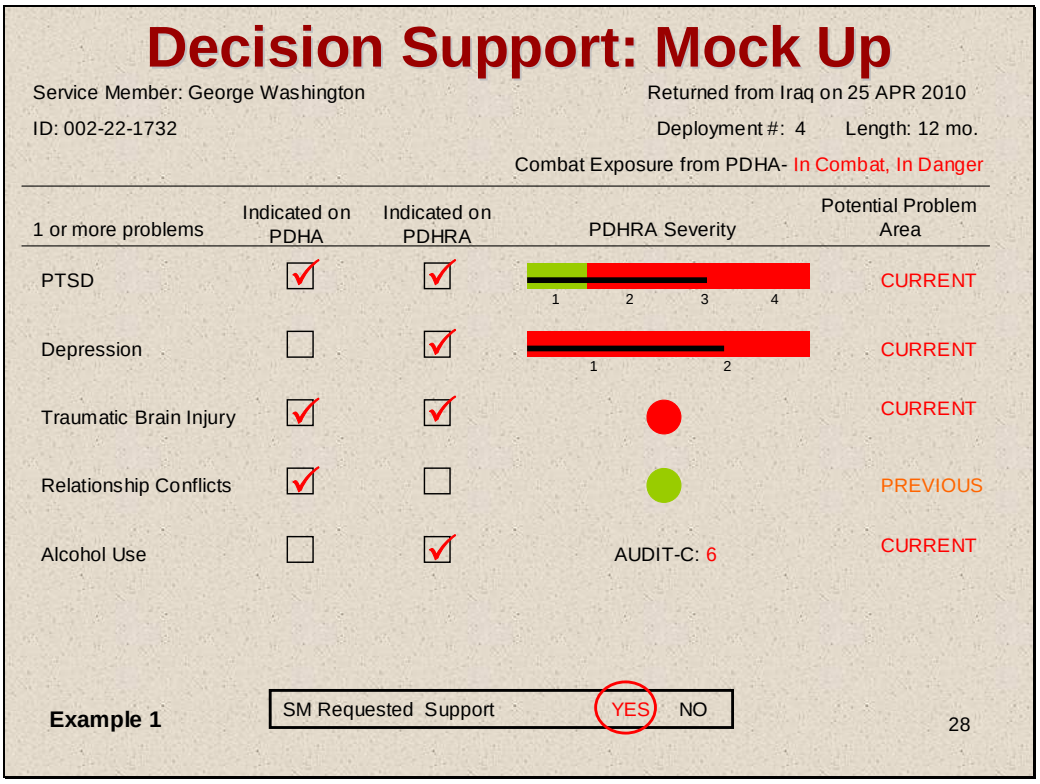
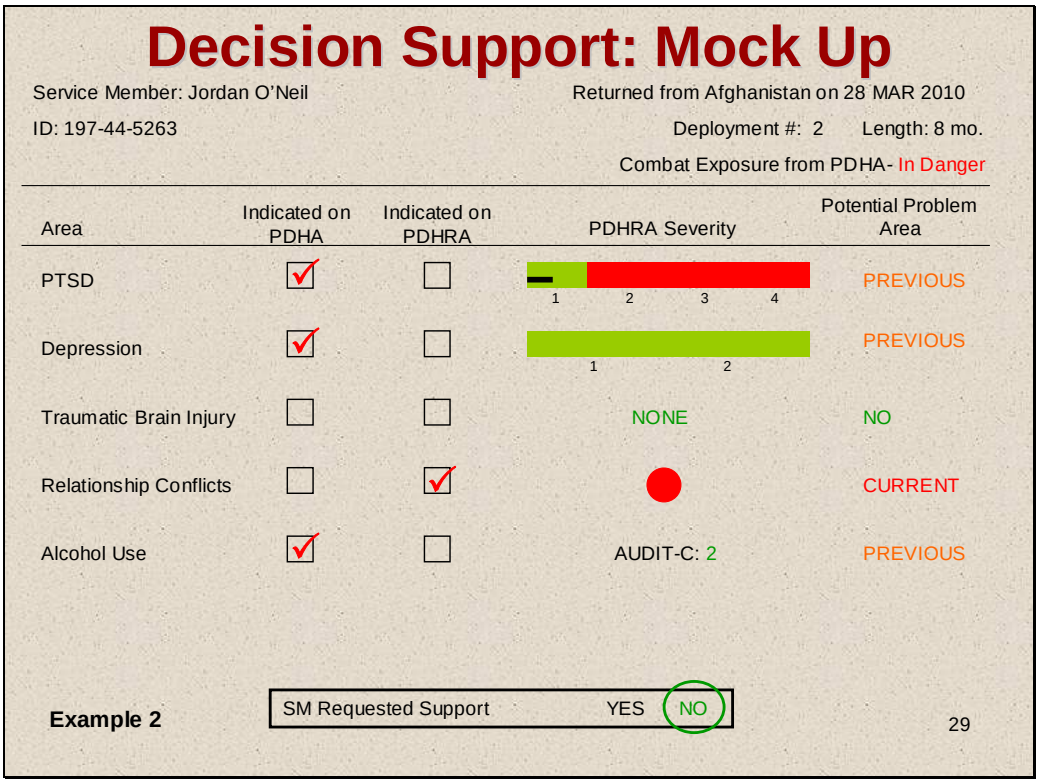

Decision Support: Mock Up
Service Member: George Washington
Returned from Iraq on 25 APR 2010
ID: 002-22-1732
Deployment #: 4
Length: 12 mo.
Combat Exposure from PDHA- In Combat, In Danger
1 or more problems
Indicated on PDHA
Indicated on PDHRA
PDHRA Severity
Potential Problem Area
PTSD
1 2 3 4
CURRENT
Depression
1 2
CURRENT
Traumatic Brain Injury
CURRENT
Relationship Conflicts
PREVIOUS
Alcohol Use
AUDIT-C: 6
CURRENT
Example 1
SM Requested Support
YES
NO
28


Decision Support: Mock Up
Service Member: Jordan O'Neil
Returned from Afghanistan on 28 MAR 2010
ID: 197-44-5263
Deployment #: 2
Length: 8 mo.
Combat Exposure from PDHA- In Danger
Area
Indicated on PDHA
Indicated on PDHRA
PDHRA Severity
Potential Problem Area
PTSD
1 2 3 4
PREVIOUS
Depression
1 2
PREVIOUS
Traumatic Brain Injury
NONE
NO
Relationship Conflicts
CURRENT
Alcohol Use
AUDIT-C: 2
PREVIOUS
Example 2
SM Requested Support
YES
NO
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Potential Decision Support Elements

PDHRA: At A Glance

Service Member: George Washington

ID: 002-22-1732

PDHRA area	Likelihood that SM has a problem and needs a referral
PTSD	80%
Depression	90%
TBI	50%
Relationship Conflicts	10%
Substance Abuse	20%

Ultimate Goal

- Input: problems consistent with diagnosable condition
- Decision: Refer unless
  - SM simply documenting deployment-related problems
  - SM currently in treatment and states no need for further evaluation
  - SM denies problem warranting referral

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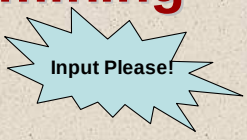
Decision Support: Determining Data Elements



- Risk factors
  - PDHA: combat exposure, previous self-reported problems, location/number of deployments
  - Presence of physical and/or exposure concerns; multiple areas
- Support rules (developed through secondary analysis and literature review)
  - Population-based benchmarks based on SM self-report (e.g., percentiles)
    - Strengths: Easily available; can develop profile-specific based on SM factors
    - Limitations: based on self-report only; may change over time
  - Concordance of SM self-report with referral alone, referral plus diagnosis, or diagnosis alone
    - Strengths: Available from PDHRA data and health care encounter data
    - Limitations: cannot evaluate false negatives; questionable gold standards
  - Algorithms for sensitivity/specificity from published literature (e.g., Bliese)
    - Strengths: Available for PC-PTSD; established gold standard of semi-structured interview
    - Limitations: Diagnosis-specific; not available for all PDHRA problem areas

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Component 3: Weekly Feedback

- Feedback ~ 5 minutes once/week individually; 10 minutes once/week as a group
  - Available each week for review
  - Each provider reviews his or her own feedback; site manager reviews all providers
  - Review at weekly staff meetings to enhance peer learning/support
- Aggregated at the level of provider and/or installation
- Allows for continuous quality improvement
  - Tracking primary PDHRA outcomes
  - Monitoring adherence to training guidelines
  - Address needs for additional supports
- Content linked to initial training and decision support

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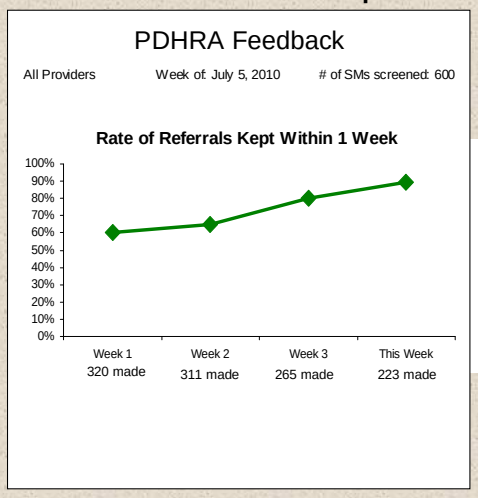
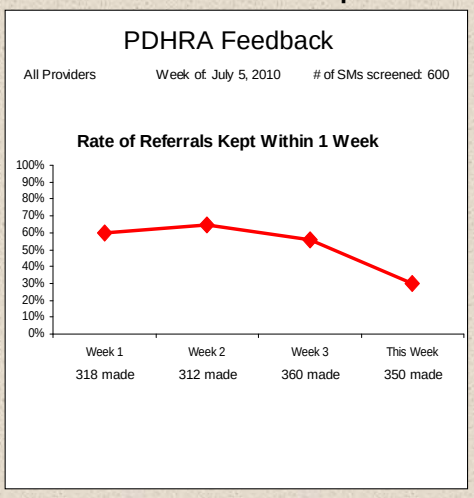
Feedback Elements: Mock Up
Referral Completion Quality Control Charts

Increased Referrals Kept



Decreased Referrals Kept



- Could provide more detailed views by problem type, referral type/time frame, etc.
- Information to lead to further inquiry and communication with MTF

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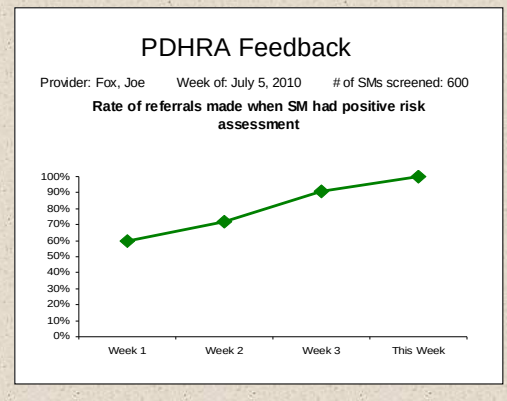
Feedback Elements: Mock Up Provider-Specific Detail



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Feedback: Determining Data Elements

Input Please!

- Organizational Issues
  - Ability to institute weekly staffing
  - Ability to integrate PDHRA and health care encounter data
- Content of feedback
  - Referral completion quality control charts (to help ensure providers are not simply increasing unwarranted referrals)
  - Comparison to decision support guidelines
  - Documentation compliance
- Unit of feedback
  - Can aggregate at any level
    - Individual SMs?
  - Over any time period
    - Previous week?
- Multiple views tailored to user (provider, site manager)
  - Main dashboard: Primary information 'at a glance'
  - Detailed views: Digging deeper

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Program Delivery Issues

Input Please!

- Options for producing decision support
  1. Housed at MedPros : Most integrated
     - VU provides algorithms and programming support
     - VU provides dates, units, locations for study sample
     - MedPros makes the form electronically available to providers along with PDHRA
     - De-identified export provided to VU for research
  2. Housed at Installation: Greater site demand
     - VU provides program
     - Installation responsible for coordination with MedPros
     - Installation responsible for procedure to make the form electronically available to providers along with PDHRA
     - De-identified export provided to VU for research
  3. Housed at VU: Most complex, least integrated
     - De-identification and re-identification process required
     - VU coordinates with MedPros and installation to coordinate data downloads by MedPros
     - VU manipulates data then provides forms to installation (mail or secure download)
     - Forms are paper copies contained in SM SRP packet

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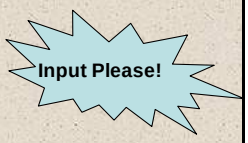
Program Delivery Issues (cont)

Input Please!

- Delivery of weekly feedback
  - Another weekly process for MEDPROS involvement post-interview
  - Access to HCE data from AHLTA needed to include completed referral information

Determining Sites



- In gathering preliminary information we have established relationships with Ft Carson, Ft Benning, Ft Campbell, and Ft Riley. POCs have indicated preliminary interest in participating, but there has been no contact with Installation Commanders
- Considerations
  - PDHRA events (scheduled March to Sept 2011)
  - Provider characteristics
  - Site agrees to pilot as QA system
  - Site able to handle potential increased referrals
  - Site ability to link AHLTA with MEDPROS (i.e., to calculate rates of referral completion)
  - Site agrees to minimal changes in PDHRA process
    - Advance scheduling of SMs so data can be available
    - PDHRA self-report completed at least 1 week prior to interview

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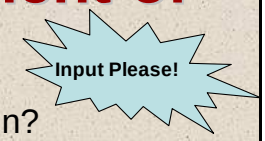
Next Steps for Involvement of Expert Panel



- Suggested modifications to program design?
- Adapting initial training based on NDAA Sec. 708
- Determining data elements for decision support and weekly feedback
  - Data analysis
  - Literature review
- Training and feedback program delivery
  - Electronic or paper form
  - Options for producing decision support
- Site selection
- Review research design

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APPENDIX E: EXPERT PANEL MEMBERSHIP ROSTER

Table E.1 Expert Panel Members

Name	Role
COL Charles Engel	Director, DHCC at Walter Reed Army Medical Center, Senior Scientist at the Center for the Study of Traumatic Stress, and Associate Professor and Associate Chair at the Department of Psychiatry at the Uniformed Services University School of Medicine
Dr. Lucinda Frost	Senior Mental Health Policy Analyst, Clinical & Program Policy, Office of the Asst Secretary of Defense (Health Affairs)
CAPT John Golden	Acting Deputy Director Psychological Health Clinical Standards of Care, DCoE
Dr. (Retired COL) Charles Hoge	Psychological Health Consultant to the Army Surgeon General
CAPT Sara Kass	Bureau of Medicine (Navy) and Navy Family Practice
Dr. (Retired COL) John Kugler	Deputy Chief Medical Officer, TRICARE Management Activity
Lt Col Hans Ritschard	Director, DoD Psychological Health Strategic Operations, Force Health Protection and Readiness
COL Louis Smith	Senior Physician's Assistant, DeLorenzo Army Health Clinic, Pentagon
Dr. Brian Sugden	Project Manager, Reserve Health Readiness Program Force Health Protection and Readiness

APPENDIX F: EXTERNAL MEETING SCHEDULE FOR YEAR ONE

Table F.1 includes Planning Meetings (Task 6), Expert Panel Meetings (Task 5), and other meetings conducted for educational or informational purposes during Year 1.

Table F. 1 External meeting schedule for year one

Date	Format	Purpose	Attendees
01-OCT-09	Teleconference	Planning—Discuss how VU might keep previously received data	VU, FHP&R
02-OCT-09 to 29-DEC-09	No weekly planning meetings with FHP&R were held during this time, because VU had not been assigned a project manager.		
26-OCT-09	Teleconference	Informational—Discuss possibility of retaining data	VU, AFHSC
23-DEC-09	Teleconference	Informational—Discuss MEDPROS data request procedures	VU, MEDPROS (Audrey Luken)
30-DEC-09	Teleconference	Planning—Discuss AFHSC data	VU, FHP&R
05-JAN-10	Teleconference	Informational/Planning—Discuss roles of MRMC and FHP&R for this award.	VU, MRMC
12-JAN-10	Teleconference	Informational—Discuss data sharing documentation requirements	VU, MRMC
12-JAN-10	Teleconference	Informational—Identify Navy contact for VU data request	VU, Navy
12-JAN-10	Teleconference	Informational—Discuss data available in Army database	VU, Army
14-JAN-10	In-Person	Planning/Presentation—Present and discuss findings from VU's previous contract that are relevant to current grant.	VU, FHP&R, representatives from multiple agencies and services (Mr. Ron Crusher, Col Joyce Adkins, LTC Jim Bennett, Dr. Terry Washam, Dr. Fred Glogower, Ms. Janet Bouncy, Mr. Joe Pedone, Mr. Larry Verbiest, Mr. Darnell Neal, Mr. Billy Dean, LTC Ball, Mr. Erik Noell, Ms. Betty Tally, LTC Tracy Neal-Walden, Mr. Rich Roeske, Mr. Jim Reis, General Williams.)
14-JAN-10	In-Person	Planning—Discuss progress/next steps	VU, FHP&R

Date	Format	Purpose	Attendees
14-JAN-10	In-Person	Informational/Approvals—Sign DUA and discuss data sharing.	VU, FHP&R, AFHSC
19-JAN-10	Teleconference	Planning—Discuss Purdue contract	VU, Purdue
24-FEB-10	Teleconference	Presentation—Present findings from VU's previous contract to FHP&R weekly journal club.	VU, FHP&R
03-MAR-10	Teleconference	Presentation—Present overview of current project	VU, FHP&R, DCoE
05-MAR-10	Teleconference	Planning—Discuss possibility of VU contributing to NDAA activities	VU, FHP&R
08-MAR-10	Teleconference	Informational—Discuss possibility/procedures for modifying SOW as relevant to NDAA	VU, MRMC
10-MAR-10	Teleconference	Planning—Discuss possibility of VU contribution to NDAA provider training	VU, FHP&R
23-MAR-10	Teleconference	Informational—Discuss actuarial modeling	VU, LTC Paul Bliese
29-MAR-10	Teleconference	Planning—Discuss NDAA	VU, FHP&R
06-APR-10	Teleconference	Planning—Develop project coordination	VU, Purdue
09-APR-10	Teleconference	Planning—Update and check-in	VU, FHP&R
20-APR-10	Teleconference	Informational—Inquire about practices and needs regarding PDHRA-specific provider training.	VU, Camp Pendleton
23-APR-10	Teleconference	Informational—Inquire about practices and needs regarding PDHRA-specific provider training.	VU, Ft Carson
23-APR-10	Teleconference	Planning—Clarify relative roles of VU, FHP&R, and MRMC for project	VU, MRMC, FHP&R
26-APR-10	Teleconference	Informational—Inquire about practices and needs regarding PDHRA-specific provider training.	VU, Fort Benning
27-APR-10	Teleconference	Informational—Inquire about practices and needs regarding PDHRA	VU, Fort Campbell
27-APR-10	Teleconference	Informational—Inquire about practices and needs regarding PDHRA	VU, Fort Riley
28-APR-10	Teleconference	Informational—Inquire about practices and needs regarding PDHRA	VU, Fort Carson
29-APR-10	Teleconference	Weekly Planning—This was the first regularly scheduled weekly planning meeting. Future schedule discussed.	VU, MRMC, FHP&R
04-MAY-10	Teleconference	Weekly Planning—Discuss conversations with installations and Expert Panel selection	VU, FHP&R

Date	Format	Purpose	Attendees
12-MAY-10	Teleconference	Weekly Planning –Discuss Expert Panel Selection and AFHSC DUA	VU, FHP&R
26-MAY-10	Teleconference	Weekly Planning—Discuss FHP&R's progress contacting potential Expert Panel members and plans for intervention design.	VU, FHP&R, MRMC, Purdue
02-JUN-10	Teleconference	Weekly Planning—Discuss project and NDAA timelines and Expert Panel selection.	VU, FHP&R, MRMC, Purdue
09-JUN-10	Teleconference	Weekly Planning –Discuss procedures for contacting installations	VU, MRMC
14-JUN-10	Teleconference	Weekly Planning –Discuss DUA and FHP&R progress contacting potential Expert Panel Members	VU, FHP&R, MRMC
18-JUN-10	Teleconference	Informational—Discuss feasibility issues regarding data manipulation	VU, MEDPROS
23-JUN-10	Teleconference	Weekly Planning –Discuss project timeline and DUA	VU, FHP&R
25-JUN-10	Teleconference	Approvals—Discuss revised AFHSC DUA	VU, VU's Division of Sponsored Research (DSR)
30-JUN-10	Teleconference	Weekly Planning—Plan for first Expert Panel meeting and discuss PDHRA schedules for Mar-Sept 2011.	VU, FHP&R, MRMC, Purdue
07-JUL-10	Teleconference	Approvals—Discuss DSR's concerns with wording in the data request	VU, VU DSR, FHP&R
08-JUL-10	Teleconference	Weekly Planning—VU presented proposed slides for July 21 Expert Panel presentation for feedback from FHP&R	VU, FHP&R, Purdue
12-JUL-10	Teleconference	Planning—Discuss ways of integrating Purdue's data into a decision support system for VU's intervention.	VU, Purdue
14-JUL-10	Teleconference	Weekly Planning—Discuss possibility of obtaining data from MedPros.	VU, FHP&R, Purdue
19-JUL-10	Teleconference	Weekly Planning—VU presented research design slides for FHP&R review and approval.	VU, FHP&R, Purdue
21-JUL-10	In-Person	Expert Panel—VU introduced proposed PDHRA provider training and feedback program so panel members could offer ideas and insights on development.	VU, FHP&R, Expert Panel
21-JUL-10	In-Person	Planning—Review Expert Panel feedback, discuss next steps, review NDAA training development.	VU, FHP&R

Date	Format	Purpose	Attendees
12-AUG-10	Teleconference	Planning—Develop Project Coordination	VU, Purdue
18-AUG-10	Teleconference	Weekly Planning –Discuss DUA, NDAA updates, and new Expert Panel Member COL Smith) recruited by FHP&R. Discuss scheduling next Expert Panel Meeting.	VU, FHP&R
20-AUG-10	Teleconference	Approvals—Clarify DSR's concerns with AFHSC DUA.	VU, VU DSR
25-AUG-10	Teleconference	Approvals—Discuss DSR's concerns with data request wording, and ways to address concerns.	VU, VU DSR, FHP&R
25-AUG-10	Teleconference	Weekly Planning –Discuss AFHSC DUA	VU, FHP&R, Purdue
26-AUG-10	Teleconference	Informational—to view a demo of DHCC's RESPECT-Mil system and discuss ways this might inform VU's work.	VU, FHP&R, DHCC (Expert Panel Member COL John Engel)
01-SEP-10	Teleconference	Weekly Planning—Discuss possibilities and procedures for obtaining data through MEDPROS.	VU, FHP&R, MEDPROS, MRMC, Purdue
01-SEP-10	Teleconference	Planning—Develop project coordination	VU, Purdue
17-SEP-10	Teleconference	Weekly Planning—share ideas on most effective way to conduct intervention based on information received about NDAA policy.	VU, FHP&R, Purdue
17-SEP-10	Teleconference	Informational—Discuss ways in which RESPECT-Mil might inform VU's work.	VU, DHCC (Expert Panel Member COL John Engel, Ms. Sheila Barry)
29-SEP-10	Teleconference	Weekly Planning—Discuss next steps and goals of in-person intervention design meeting with Purdue the next day (Year 2)	VU, FHP&R

APPENDIX G: PURDUE LITERATURE REVIEW – PTSD PREVALENCE AND RISK/PROTECTIVE FACTORS

One of the goals of our secondary analysis is to develop a comprehensive estimate of PTSD prevalence among OIF/OEF veterans, using information from the PDHA, PDHRA, and medical records data. As such, we review here various current estimates using different samples and methodologies to establish the range of current estimates and to explore the impact of different methodologies and definitions on those estimates. To date, no definitive count is available of service members and veterans who were ever deployed to Iraq or Afghanistan and are impaired with PTSD, either diagnosed or undiagnosed. In a special guest editorial, Bass and colleagues discuss three main problems with the current prevalence rates of TBI and PTSD in the OIF/OEF population. First, the studies generally report the percentage of service members who screen positive for TBI or PTSD, not those who have been diagnosed with the condition by an appropriately trained medical provider. Second, the study samples are not representative of the entire ever-deployed military population. Most of published studies on TBI and PTSD are often combat troops in the Army or Marine Corps, less frequently including support personnel or personnel from the Navy or Air Force. Third, the degree of impairment for service members who have or have had TBI or PTSD is unknown (Editorial, 2009)

Prevalent estimates vary with the diagnostic criteria applied (cut-offs), the sample studied, and the assessment procedures used. For example:

1) Millken et al. (2007), reported that using a threshold of 3 out of 4 rather than 2 out of 4 almost halved their estimate to 6.l2 from 11.8 percent for active Army soldiers immediately post deployment. Recent reports indicated that service members were more than 2 times as likely to report mental health concerns 3 to 4 months after returning from deployment compared with reporting immediately on return (Bliese, et al., 2004). This has led to a decision to expand the scope of the current US military screening program to include a repeat measure at 90 to 180 days after deployment (Deployment Clinical Health Center (DHCC), 2010).

2) As to screening tools, a number of different instruments have been developed over the last two decades to measure or diagnose PTSD in adults including Mississippi Scale for Combat-related PTSD (M-PTSD), PTSD Checklist (PCL), and alternative versions of the PTSD module of the Diagnostic Interview Schedule (DIS), among others. Screening tools may have limited predictive value for individuals.

3) The assessment timeframe also contributes to varying estimate rates of PTSD. Screening immediately upon return has low specificity and positive predictive value. Positive predictive value is highly dependent on the prevalence of the disorders, and a positive predictive value would be expected to be lower for screening tests applied on return from deployment compared with 3 to 4 months later. In three wave longitudinal study, soldiers were found to be at an increased risk for developing PTSD over time (Wolfe, Erickson, Sharkansky, King, & King, 1999).

Studies of veterans conducted years after their service ended have shown a prevalence of current PTSD of 15 % among Vietnam veterans and 2-10% among veterans of the first Gulf War

(Kang, Natelson, Mahan, Lee, & Murphy, 2003; The Iowa Persian Gulf Study, 1997). The National Vietnam Veterans Readjustment Study shows 19% Vietnam veterans reported lifetime PTSD (Dohrenwend, et al., 2006; Hoge, et al., 2004). Similarly, Hoge (2004) found as many as 17-19% of active duty component soldiers screened positive for PTSD, depression, or anxiety upon returning from OEF/OIF.

Because estimates of current and lifetime PTSD are rather divergent and differ by sample, timeframe, and screening tool, we will now review estimation procedures, focusing on PTSD among veterans from Iraq and Afghanistan only.

Data

Hoge et al. (2004): Members of four U.S. combat infantry units (three Army units and one Marine Corp unit) either before their deployment to Iraq or three to four months after their return from combat duty in Iraq or Afghanistan. To assess the representativeness, they compared the demographic characteristics of respondents with those all active-duty Army and Marine personnel deployed to OIF and OEF using the Defense Medical Surveillance System. However it still cannot be generalized to other components, such as NGR (National Guard Reserve).

Hoge et al. (2006): The US military has conducted population-level screening for mental health problems among all service members returning from deployment to OEF, OIF and other locations, that is, **PDHA(Post-Deployment Health Assessment)** during the first year after return. This study obtained data from PDHA.

Seal et al. (2007), Seal et al. (2009): Using national **VA (Veteran Affairs) data**, Study population consisted only of OIF and OEF veterans who were first time uses of VA services after their OEF or OIF military service. Estimated rates will be bias in that rates of preexisting or new mental diagnoses may be higher among OIF and OEF veterans who use the VA health care system compared with non users. Results are not generalizable to all veterans of OEF/OIF service because no data on veterans who have not accessed VA care.

Milliken et al. (2007): The DMSS (Defense Medical Surveillance System); Both PDHA (Post Deployment Health Assessment) and PDHRA (Post Deployment Health Assessment) is a part of the soldier's permanent medical recode, and an electronic copy is integrated into the DMSS. For active component solders, all health care that they receive in military treatment facilities is reported to DMSS including clinic type and diagnoses.

Rand study "Invisible Wounds of War" (2008): It is one of the most widely cited studies of OIF/OEF veterans' health. This study is based on interviews of a representative sample of 1965 returning troops from Iraq and Afghanistan from August 2007 to Jan 2008. The survey of recently returned service members drew from the population of all of those who have been deployed for OIF and OEF, regardless of Service branch, component, or unit type. The survey used random digit dialing to reach a representative sample within the targeted locations.

[Gulf study – not OIF/OEF: (Kang, et al., 2003) Data: the Defense of Manpower Data Center provided military and demographic information. A stratified sampling method was adopted to ensure that each subgroup was adequately represented among the 15,000 Gulf Veterans. The entire population of troops deployed to the Gulf area was stratified by gender, unit component (active, reserve, and National Guard), and branch of service (Army, Navy, Air force, and Marine Corps). Random stratified sampling. The results shows that the veteran positive for PTSD criteria more likely to be female, older, non-white, in the enlisted ranks, and in the Army and National Guard. 10.1 percent, the population prevalence a PTSD.]

Screening Tool for PTSD

PTSD symptoms were frequently assessed using PTSD Checklist Military version (PCL-M) , a 17 self-reported items rated from 1 to 5 pts on a Likert-type scale. The PTSD cut-off requires a global score of 50 and the symptoms endorsed at a moderate or high level. PTSD diagnosis was evaluated with the use of the 17-item National Center for PTSD checklist of the Department of Veterans Affairs (Hoge, et al., 2004; *Hoge et al., 2004 ; Kang, et al., 2003; The Iowa Persian Gulf Study, 1997)*

Hoge et al (2004): The PDHA includes a 4-item screen for PTSD, developed by National Center for PTSD for primary care settings (PC-PTSD). They use 2 or 3 items out of the 4-items PTSD screen as a cutoff.

Seal et al. (Seal, et al., 2007; Seal, et al., 2009) utilize ICD-9-CM codes (*International Classification of disease, Ninth Revision Clinical Modification*).

Milliken et al. (2007): the four-question Primary Care-PTSD screen (PC-PTSD) asks respondents whether they experienced certain symptoms in the past month due to a traumatic event. A positive screen was recorded if the respondent endorses at least two of the four PTSD related items.

Rand study, "Invisible Wounds of War" (2008): based on the responses to a telephone administration of the PTSD Checklist (PCL). The PCL module contains 17 questions covering the three symptom clusters of PTSD: reexperiencing trauma, avoidance, and hyper-arousal. Each question is scored on a 5-point scale with a maximum possible score of 85. One scoring method assesses a probable case of PTSD if the respondent endorses with a value of at least 3 on the 5-point scale. The Rand study asserted that the PCL scored via this method (***cluster method***) has a sensitivity of 1.00 and a specificity of 0.92.

Time Frame

Hoge et al (2006) , Seal et al (Seal, et al., 2007; Seal, et al., 2009) and Miliken et al (2007) utilize existing data that contain mental health information (including PTSD) and estimate prevalence of PTSD; Hoge et al. (2004) conducted a survey to assess mental health among veterans from OIF and OEF. The research shows that majority of people in whom PTSD develops meet the criteria for the diagnosis of this disorder *within the first three months* after the traumatic event.

Hoge et al. (2004) administered the surveys three to four months after the subjects had returned from deployment and at least six months after the heaviest combat operations.

Seal et al. (Seal, et al., 2007; Seal, et al., 2009) determined the cumulative prevalence of mental health diagnoses in the VA system during the entire study period. The study period consisted of 24 calendar quarters from April 2002 through March 2008.

Millken et al. (2007): The military's health assessments were given to service members immediately upon their return home and again about 6month later (PDHA/PDHRA). Note that this study is based on existing medical surveillance data.

[In the study of Gulf War veterans (Kang, et al., 2003), sampling was obtained from database and mental health related survey was conducted. Data was obtained from the Defense of Manpower Data Center and provided military and demographic information. A stratified sampling method was adopted to ensure that each subgroup was adequately represented among the 15,000 Gulf Veterans. The entire population of troops deployed to the Gulf area was stratified by gender, unit component (active, reserve, and National Guard), and branch of service (Army, Navy, Air force, and Marine Corps). Random stratified sampling. The results showed that the veterans positive for PTSD criteria were more likely to be female, older, non-white, in the enlisted ranks, and in the Army and National Guard. 10.1 percent, the population prevalence of PTSD.]

Results (Estimated Rates)

Hoge et al. (2004) Based on strict definition, rates ranged from 6.2% to 12.9%; based on broad definition, they ranged from 11.5% to 19.9%.

Hoge et al. (2006) reported that of 303,905 army and marine veterans, 35% accessed military mental health services within 1 year of returning home. It is unclear what proportion of the 35% involved PTSD. Using either 2 or 3 items out of the 4 item PTSD screen as a cut-off, between 4.7% and 9.8% screened positive in this population. Hoge et al. (2006) stated regarding the differences in rates between two studies: "the difference in scales used, whether the surveys included identifiers, and particularly differences in the timing of the surveys."

Seal et al. (2007) The frequency of ICD-9-CM PTSD Diagnoses observed among OEF/OIF veterans in this study is 13%.

Seal et al. (2009) 2-year period prevalence of new PTSD diagnoses is 18.2% among final cohort of OIF and OEF veterans entering the VA health care system Jan 2006 and followed 2 years.

Milliken et al. (2007) examined military PDHA and estimated that 12 percent of active Army personnel and 13 percent of Army reservists screened positive for PTSD symptoms immediately upon returning from deployment. Those rates rose to 17 and 25 percent of active and reserve soldiers respectively at the PDHRA.

(Rand, 2008). 18.5% of all returning SMs meet criteria for either PTSD or depression; 14% of returning SMs currently meet criteria for PTSD. If these numbers are representative, then of the 1.64 million deployed to date, the study estimates that approximately 300,000 veterans who have returned from Iraq and Afghanistan are currently suffering from PTSD or major depression. JRRD Guest Editorial stated that "RAND's survey was not representative of the ever-deployed military population. It did not account for features of and events occurring during deployment. The weighted percentage of service members who claimed to have returned from their second or higher deployment was 47 percent; population based data from DOD (Department OF Defense) indicated that through Feb. 2008 only 36 percent of service members who had deployed to either Iraq or Afghanistan did so multiple times."

Risk Factors

Overall, not many of these studies reviewed above explicitly addressed risk and protective factors of PTSD. Those factors are included as control variables in most of studies. Hence, in addition to the studies reviewed above that specifically estimate prevalence or incidence rates of PTSD, we also review studies below that focus on risk and protective factors, because, in addition to estimating prevalence of PTSD, we are also interested in examining service-level, family-level, and individual-level risk and protective factors.

OVERVIEW

Meta-analyses have identified several risk factors for PTSD in both the military and general population (Brewin, Andrews, & Valentine, 2000). Pre-trauma factors such as family psychiatric history, personal psychiatric history, and childhood abuse most consistently predicted PTSD, regardless of the population studied or the methods used. Other important risk factors for veterans included younger age at the time of the trauma, less education, minority race/ethnicity, and family adversity. Trauma severity and post-trauma social support were more important in military than in civilian samples.

In studies of PTSD specifically in veterans, predisposing factors have included minority race/ethnicity, lower education, younger age at exposure, lower SES, family problems in childhood, pre-trauma psychopathology, and childhood behavior problems. Event characteristics that increase risk for PTSD include type of trauma, amount of exposure, injury, involvement in atrocities, and perceived life threat. Post event factors that predict PTSD in veterans are low social support, negative homecoming experiences, and poor coping and posttraumatic life events. High social support may be a protective factor against developing PTSD in the general population (Brewin, et al., 2000; Ozer, Best, Lipsey, & Weiss, 2003) and military settings (Green, Grace, Lindy, Gleser, & Leonard, 1990; Green & Berlin, 1987; King, King, Fairbank, Keane, & Adams, 1998; Solomon, Margalit, Waysman, & Bleich, 1991).

Service-level factors

PTSD in SMs has been found to be associated with being in the enlisted ranks, in the Army (versus Marine Corp, Air Force, Navy) and National Guard (versus Active duty, Reserve, Kang et

al 2003). Studies of veterans from the Gulf War similarly show that non-active duty personnel (i.e., Reserve and National Guard) reported experiencing more PTSD symptoms than active duty personnel (Stretch, Marlow, & Wright, 1996) (Stretch et al., 1996). In terms of military rank, enlisted personnel have reported more PTSD symptoms than officers (Adler, Vaitkus, & Martin, 1996). A more recent study shows that SMs enlisted (versus officer) and serving in the US Marine Corps or US Army (versus Air Force, Navy, or Coast Guard) are more likely to have PTSD, which differs from other studies that have found lower rates of PTSD in the Marine Corps (Wells, et al., 2009). PTSD is also more common in short-term, lower rank Army personnel (Iverson, et al., 2008; Riddle, et al., 2007). Iversen et al's (2008) study on UK forces found the association between PTSD and component, with the Royal Navy and Army experiencing greater symptoms than those in the Royal Air Force. The Royal Marine Commandoes (Elite Naval Service combat troops) had a relatively low prevalence of PTSD.

Seal et al (2009) examined the association of service component with the development of PTSD more specifically by taking age distribution in each component into account. Seal et al. (2009) found that in multivariate analyses adjusted for socio-demographic and military service characteristics stratified by component type, the youngest active duty veterans, aged 16-24 years, were at the highest risk for diagnoses of PTSD compared with active duty veterans older than 40 years. Younger active duty veterans likely had greater combat exposure as a function of lower rank, which may explain higher rates of mental health diagnoses. Among active duty veterans, proxies for combat exposure-rank, branch, and multiple deployments were independently associated with higher risk of PTSD. By contrast, older National Guard and reserve veterans older than 30 years were at higher risk for PTSD and depression than were younger National Guard and reserve veterans. One explanation for greater distress among older national guard and reserve members is that, when called to arms, they are more likely established in civilian occupations; have family, social, and community ties; and may have had less preparation for combat, making their transition to the war zone and then home again more stressful (Friedman, 2005; Jacobson, et al., 2008).

The finding on higher rate of PTSD for NGR is also shown in studies on the (course of) PTSD development. NGR (National Guard/Reserve) troops are at increased risk for the development of emotional and psychological complications compared to active duty troops (MHAT-II, 2005). Milliken and colleagues (2007) found that rates of PTSD and depression more than doubled among NGR component soldiers between initial Post-Deployment Health Assessment and the Post-Deployment Health Reassessment conducted about 6 months later. Another recent study also shows that the increase in emotional problems over time for NGR soldiers exceeded the rates found in regular active duty service members (Polusny, et al., 2009). This risk for the development of psychiatric disorders appears to increase at a greater rate for NGR soldiers in the months and years following deployment. The increase in emotional problems over time for NGR soldiers exceeded the rates found in regular active duty component service members. Studies for the veterans from the Gulf War have shown similar results. For example, in a three-wave longitudinal study of 2,949 Gulf War I veterans, Wolfe and colleagues found that NGR soldiers were at increased risk for developing PTSD over time (Wolfe, et al., 1999). Initially at time 1, when soldiers were assessed about4-5 days following their return from deployment to

Gulf War I, NGR status was not associated with PTSD symptoms. However, NGR status independently contributed to the development of PTSD 2 years later in this same cohort. Following deployment, NGR component soldiers may face unique reintegration challenges as they transition back to civilian roles. Compared to active duty soldiers, NGR soldiers tend to be older and may be more likely to have left family and civilian work responsibilities outside the military.

As a result, NGR troops may face significantly greater familial and occupational strain both during and following deployment, and these challenges may contribute to NGR soldier's elevated risk for mental health difficulties post deployment. For instance, post deployment stressful life events have been shown to be associated with higher rates of PTSD (Green, et al., 1990). Further, because they have not embedded with their military units following a combat deployment, NGR personnel may also have lower levels of support from social and occupational peers, which may also increase risk for PTSD (King, et al., 1998)

Finally, Keane (2006) found the number of firefights, frequency and intensity of combat, injury, rank, component, military branch, combat exposure, intensity and duration of combat, the extent of physical injury, and adjustment during military service to be associated with PTSD.

Family-community-level factors

The association between social support and the development PTSD is very robust in combat veterans compared to civilians exposed to interpersonal violence (Brewin, et al., 2000). Vietnam veterans who report active engagement in the community are less likely to have PTSD (Koenen, Stellman, Stellman, & Sommer, 2003). Sutker, Davis, Uddo, and Ditta (1995) found that a lack of family cohesion predicted the development of PTSD in Persian Gulf veterans. Vietnam veterans who discussed their military experiences demonstrated decreased rates of PTSD (Green, et al., 1990; Koenen, et al., 2003). Veterans who reported discomfort in disclosing their Vietnam service experiences to friends or family demonstrated an increased risk for developing PTSD. Combat exposure increased likelihood of PTSD while Unit support, or group cohesion, reduced risk (Roberto & Koob, 2009).

*P*erceived negative community attitudes at homecoming and community involvement at time1 were protective and associated with decreased risk at time2 (Koenen, et al., 2003). Discomfort in disclosing Vietnam experiences was associated with an increased risk for developing PTSD, but did not predict its course over time. Recovery from PTSD was significantly influenced by perceived social support at home. Additionally, low morale and social support within the unit and non-receipt of a homecoming briefing were associated with greater risk of PTSD. These results raise the possibility that there are important modifiable occupational factors such as unit morale, leadership, preparing combatants for their role in theatre which may influence an individual's risk of PTSD.

The review by Keane (2006) also found social support, intimate partner relationship, and societal attitude toward the war to be associated with the development of PTSD.

Individual-level factors

In a study of Vietnam veterans, results showed lower PTSD is associated with higher education, older age at Vietnam entry, higher SES, more positive parental relationship, more social support at homecoming, and more current social support (Schnurr, et al., 2003). In the later wars, women have consistently been found to experience more severe PTSD symptoms compared to men (Breslau, Davis, Peterson, & Schultz, 2000; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Additionally, younger age (e.g., Kessler, et al., 1995), minority race/ethnicity (e.g., Kulka, Research Triangle, & United States. Veterans, 1988; Ursano, et al., 1999), and less education (e.g., Shalev, Peri, Canetti, & Schreiber, 1996)) have all been found to be risk factors for PTSD. Men, whites, those reporting more education, and those reporting less combat exposure had a significantly lower probability of being classified into the PTSD symptomatic group (Orcutt, Erickson, & Wolfe, 2004).

A recent review of risk factors found gender, education, SES status, history of child abuse, intensity and duration of combat, the extent of physical injury, younger age, minority race/ethnicity, history of psychiatric illness, family history of anxiety, antisocial personality disorder, history of childhood adversity, sense of lack of personal control, feelings of security, and alienation from others, parental PTSD, and family background as possible risk factors for PTSD (Keane, et al., 2006).

APPENDIX H: PRESENTATION OF KEY FINDINGS FROM VANDERBILT EVALUATION: ARMY PDHRA CONFERENCE

Evaluation of the Post-Deployment Health Reassessment (PDHRA) Process

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2

Presentation Goals: To Describe

- Evaluation Purpose and Design
- Key Findings
  - Effects of the PDHRA
  - Factors Associated with SM Self-reported Problems on PDHRA
  - SM Disclosure on PDHRA
  - Unit Leadership and Education Important to PDHRA Process
  - Clinician and Context Factors
- Recommendations

3

Evaluation Purpose

Assess how the PDHA and PDHRA contribute to increasing Service Member (SM) access to appropriate care

4

Evaluation Purpose: Major Tasks

1. Identify factors that influence the PDHRA process and SM satisfaction.

2. Describe how key individuals involved perceive and carry out their roles related to the PDHRA process.

3. Determine how the context of the clinician screening influences efficacy. Are phone-based assessments equivalent to in-person assessments?

4. Describe communication patterns and topics discussed between PDHRA clinicians and SMs as it influences SM disclosure of problems and acceptance of referrals.

5. Provide overall evaluation and recommendations

5

Evaluation Design

- Multiple methods and data sources
- Major components
  - Analysis of PDHA (300k), PDHRA (n=251k), and health care utilization (n=2.1M) for SMs between 01-JAN-06 and 15-MAR-09
  - SM survey (n=6,714) to identify SM-related factors that may influence the PDHRA process and satisfaction with the process
  - Quasi-experimental study (n=766) to examine the effects of Battlemind II on SM reporting and referral acceptance
  - Semi-structured interviews with 100 key participants in the PDHRA process and observations of PDHRA process at 10 installations
  - Content analysis of audio recordings of 272 PDHRA clinician interview calls (Reserve component only)
  - Analysis of PDHRA context (e.g., in-person v. telephone interview) using 52,556 records provided by contracting agency for PDHRAs completed between February 2008 and March 2009 (Reserve component only)

6

Focus on Process and PDHRA Components

- **SM Characteristics Accounted for in Analysis**
  - Cohort (year departed theater)
  - Time between departure and PDHRA
  - Service Branch and component
  - Combat exposure (from PDHA)
  - Deployment location
  - SM total self-reported problems

7

Generalizability of Findings

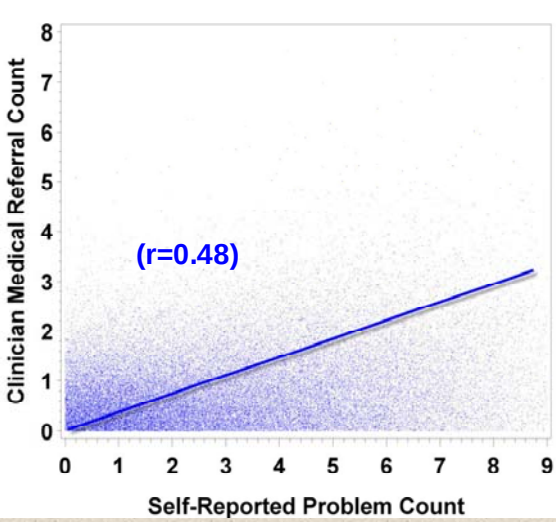
- Results based on analysis of the full sample of PDHA and PDHRA records can be generalized
- Results including analysis of health care encounters (HCE) can be generalized to Active duty only
- Results based on sub-samples (SM survey, Battlemind II study, semi-structured interviews, audio recordings, and context) should not be generalized

8

Key Findings: Effects of the PDHRA

9

PDHRA Process Works—SMs in Greater Need get More Referrals



Number of SM problem areas explains a substantial 20% of the variance in number of medical referrals (R^2=0.20)

10

SMs in Greater Need get More Referrals

- Those who got a referral had an average of 4.5 problem areas, while those receiving no medical referral endorsed an average of 2.8 problem areas.
- Being under care did not influence whether or not SMs received a medical referral
- No evidence that SMs declining a referral is related to
  - Previous referral from PDHA
  - Health care encounters between PDHA and PDHRA

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Active duty SMs With Medical Referrals Have More Health Care Encounters (HCE)

- All SMs had more care after PDHRA
  - HCE increased 50% after the PDHRA regardless of referral
  - From 0.9 HCE (in 6 weeks prior) to 1.5 HCEs (in 6 weeks post) on average
- Compared to 6 weeks prior SMs with medical referrals had more HCEs in 6 weeks post-PDHRA
  - 0.5 more HCEs on average with no medical referral
  - 1.2 more HCEs on average with medical referral

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SMs Generally Satisfied with the PDHRA Process

- SMs were neutral to positive that the PDHRA helped them to identify their concerns (3.3 on a 1-5 scale)
- SM satisfaction with the PDHRA clinician averaged 3.6 (on a 1-5 scale)

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Unit Leaders are Ambivalent About the PDHRA

- Many unit leaders indicated that the PDHRA positively affected their SMs' military readiness
- However, unit leaders rarely receive feedback so no way to measure PDHRA effectiveness
- Majority did not feel that the process helped them to identify SMs with physical or mental health problems
- Unit leaders had concerns about
  - Over-identifying SMs as having problems
  - Time away from other duties and conflicting priorities

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Key Findings: Factors Associated with SM Self-Reported Problems on PDHRA

15

PDHA Responses Strongly Predict PDHRA

- Symptoms reported at the PDHA were also likely to be endorsed at the PDHRA (correlations between 0.31 and 0.54)
  - 80% of SMs who reported a problem on PDHA also reported a problem on PDHRA
  - Particularly true for TBI (OR=21.6), PTSD (OR=7.7), and depressive symptoms (OR=8.0)
  - We did not examine the percentage of new symptoms reported on the PDHRA when not previously reported on the PDHA
- Intervening HCEs did **not** influence PDHRA reporting
- Supports usefulness of the PDHA in predicting specific problems on PDHRA
  - Considering only the self-report, the best predictor of endorsing a symptom on the PDHRA is having previously endorsed the same symptom on the PDHA. Having endorsed any *other* problem on the PDHA is a much weaker predictor of a specific problem on the PDHRA.

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Combat Exposure Leads to Greater Likelihood of SM Problems on PDHA/RA

- SMs who reported combat exposure on PDHA were
  - Almost three times more likely to report any problem on the PDHA
  - Twice as likely to endorse any problem area on the PDHRA
- Significant but small relationship to the number of self-reported problem areas
  - PDHA (R^2=0.10)
  - PDHRA (R^2=0.12)

17

Many SMs Report Behavioral Health Symptoms on the PDHRA

- Behavioral health problem areas reported by SMs
  - 24% one or more symptoms of PTSD
  - 10% one or more symptoms of depression
  - 13% single item on relationship conflict
- These rates are similar to SM reports of other types of problems
  - 29% one or more physical health symptoms
  - 25% one or more exposure concerns
  - 14% one or more TBI symptoms

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Key Findings: SM Disclosure on PDHRA

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SM Survey Methods

- Vanderbilt developed a survey to identify SM-related factors that may influence the PDHRA process and satisfaction with the process
- All surveys were anonymous
- Overall 6,714 surveys collected from SMs who just completed PDHRA
  - 3,768 collected by LHI at 34 travelling team events
  - 2,936 collected by VU at 9 site visits, and some Air Force SMs (n=256) completed the survey online.
  - 2,217 surveys were linked to PDHRAs using methods that did not compromise anonymity

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Many SMs Admit to Underreporting Problems on PDHRA

- Asked anonymously, two-thirds of SMs agreed that they had fully disclosed physical, emotional, or alcohol use concerns
- 10-14% of SMs reported that they did not fully disclose these problems
- An additional 25% chose not to indicate (neither agree nor disagree) the status of their disclosure
- Clinicians interviewed about PDHRA process estimated about one-third of SMs do not fully disclose on PDHRA

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SMs Underreport Behavioral Problems on PDHRA Compared to Anonymous Survey

- On the SM survey, 39% of SMs either reported a problem and/or had friends or family members suggest they seek help
  - 34% of SMs reported experiencing an emotional, alcohol, stress, or family problem since deployment
  - 22% had friends or family suggest seeking help for such a problem
- These SMs had more negative attitudes toward help-seeking and accepting mental health treatment than SMs who did not report a problem on the SM survey
- **43% did not report any behavioral health problems on PDHRA**

22

Concerns about Confidentiality may Discourage SM Disclosure on PDHRA

- SMs were less likely to agree that they had fully disclosed on the PDHRA when they
  - Were seeking promotion in the next 6 months
  - Knew the PDHRA clinician before the interview
- Only 25% knew that current DoD policy no longer requires disclosing deployment-related mental health treatment on Q21 of SF86 when applying for security clearance
- Inadequate privacy for clinician interview observed during 2 of 10 site visits

23

Stigma May not be Directly Related to Disclosure on the PDHRA

- No evidence of a direct relationship between stigma and our measures of PDHRA self disclosure in this evaluation
- There may be complex indirect relationships requiring further analysis
  - Stigma related to disclosure greater for SMs:
    - Seeking promotion in next 6 months
    - Experiencing an emotional, alcohol, family, stress problem since deployment
    - Friends/family suggested seeking help for such a problem
  - These 3 variables associated with SMs indicating less than full disclosure on PDHRA

24

Informal Support from Family and Friends may Encourage Disclosure on the PDHRA

- Among SMs who reported emotional, alcohol, stress, or family problems on the SM survey
  - Few (30%) sought help from medical/mental health professionals
  - Even fewer (22%) talked to religious/spiritual leaders
  - A majority (74%) had spoken to family or friends
- SMs who had spoken to family/friends reported greater post-deployment support and indicated they were more willing to fully disclose on the PDHRA

25

PDHRA Education May Encourage SM Disclosure

- SMs were more likely to agree that they had fully disclosed on the PDHRA when
  - Briefed on the PDHRA from a unit leader
  - Received education on post-deployment and reintegration issues in the form of written materials, film/video, or websites
  - Exposed to Battlemind II (7-10% higher than SMs not exposed)

26

Yet Education not Widely Used nor Consistently Available

- Pre-briefs varied as observed during PDHRA events
  - 6/10 events where PDHRA mentioned by name
  - 3/10 events where PDHRA process explicitly explained
- About half or fewer SMs reported using deployment cycle educational materials prior to completing PDHRA
- Yet when these materials were used, the majority of SMs found them helpful

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Key Findings: Unit Leadership and Education Important to PDHRA Process

28

Unit Leader Involvement and Support Important to PDHRA Process

- Command support important in educating SMs and generally setting the stage to encourage SM openness during the process
- More positive SM attitudes about post-deployment support and help seeking, PDHRA leadership support, and unit cohesion for personal problems when:
  - At least one NCO or Officer in theater with them
  - Unit NCO or Officer briefed them on the PDHRA
- PDHRA leadership support related to more positive SM attitudes
  - Higher post-deployment support and help seeking, unit cohesion for personal problems, satisfaction with the PDHRA clinician, general willingness to self-disclose
  - Lower perceived stigma related to disclosure and fewer barriers to accepting mental health referral

29

Quasi-experimental Study of Battlemind II

- Design
  - Two groups
    - Group 1: SMs exposed to Battlemind II video and discussion prior to PDHRA
    - Group 2: SMs did not receive Battlemind II training prior to PDHRA
  - Originally intended as randomized control study; however units assigned to groups based on schedule (PDHRA event on different days)
- Participants
  - One site included in analyses (Army Active)
  - 501 SMs in BMII condition, 265 SMs in No BMII condition

30

Battlemind II related to more positive attitudes to PDHRA on SM Survey

- Similar rates of anonymous reporting of behavioral health problems regardless of Battlemind II exposure
- SMs exposed to Battlemind II
  - Had more positive attitudes toward the PDHRA
    - More post-deployment support and help seeking
    - Higher satisfaction with the PDHRA clinician
    - More general willingness to self-disclose
    - Less perceived stigma related to disclosure
    - Fewer barriers to accepting mental health referral
  - Agreed that they more fully disclosed on the PDHRA
    - Physical health concerns (66% v 55%)
    - Emotional health concerns (62% v 50%)
    - Alcohol use health concerns (65% v 52%)

31

BMII Study Conclusions

- Psychosocial education such as Battlemind II may improve the PDHRA process
- Study is limited by its focus on attitudes only
- Additional research needed to understand if BMII leads to actual changes in disclosure on PDHRA, which can be found in our data

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Key Findings: Clinician and Context Factors

33

Clinical Interview Focuses on SM Self-Reported Problems

- According to on-site clinicians interviewed by VU staff
  - Primary purpose of the PDHRA was to identify and address SM concerns and get them the help they need
  - Clinicians reported using positive responses from the SM self-report and built-in alerts (e.g., for alcohol use problems) to guide the interview in addition to SM eye contact, sincerity, and expressions
- Results from secondary analysis, SM survey and analysis of de-identified audio recordings of PDHRA interviews are consistent with findings from interviews
- Interview provides value in confirming problems, but does **little to increase sensitivity of the clinical interview (i.e., increasing disclosure beyond what is already in SM self-report)**

34

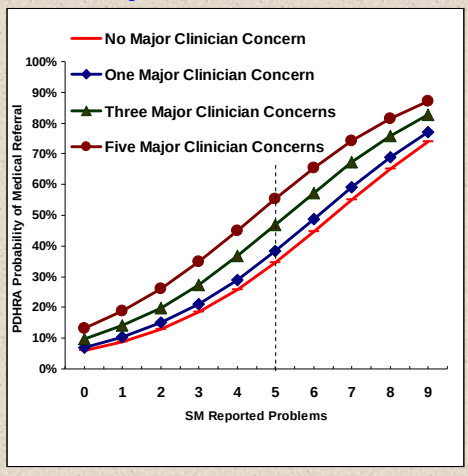
Clinician Interview Adds Value to Increasing Medical Referrals

- The number of SM-reported problem areas are the main predictor of a medical referral (R^2=0.20)
- After accounting for SM problems and characteristics, the clinical interview as documented on the PDHRA adds a relatively small but significant contribution (R^2=0.07)

35

Number of Major Clinician Concerns Increases Referrals

Probability of medical referral at differing levels of clinician concerns



When SMs endorsed 5 problem areas

- No major clinician concerns → 35% probability of medical referral
- 5 major clinician concerns → 55% probability of medical referral

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Clinical Interview Misses Many Problems for SMs Who Do Not Disclose them on PDHRA Self Report

- We compared (a) number of clinician major concerns and (b) whether a medical referral was given for two groups of SMs:
  - **Non- Disclosers** - reported behavioral health problems on SM survey, but not on PDHRA (n=282)
  - **Disclosers** - reported behavioral health problems on SM survey and on PDHRA (n=380)
  - Findings
    - (a) Average number of clinician major concerns was **five times** lower for SMs who did not disclose on the PDHRA (means 0.11 vs. 0.53)
    - (b) Receipt of one or more medical referrals (for any reason) was almost **three** times lower for SMs who did not disclose on the PDHRA (means 0.14 vs. 0.67)

37

Low Reliability in Clinician Interviews Across Multiple PDHRAs

- Multiple completions for a single deployment were compared (3,720 records; 1860 SMs)
- More stable over time for SM self-report compared to clinical portion
  - SM self-report correlations very strong (r=0.6-0.9)
  - Clinician portion correlations were much lower (r=0.2-0.5)
- Poor reliability of clinician interview not likely due to intervening HCE or changes in SM health status
  - SM self-reports within one week (aggregated r=0.88)
  - Clinician portion within one week
    - Risk assessment (r=0.55)
    - Major concerns (r=0.43)
    - Referrals (r=0.38)
- Note that clinicians are most likely different people at different times
- The lack of consistency in the clinician interview may be due to differences in clinician interview approach and documentation

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There is a Lack of Systematic and Intensive Training Specific to PDHRA

- Clinicians interviewed about PDHRA process indicated that training was generally limited to shadowing of other clinicians
- Structured feedback not routinely provided
- Potential reason for the low reliability

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Lack of Time and High Caseloads for Interview May Limit Effectiveness

- PDHRA clinician interviews generally short
  - 59% of SMs surveyed reported duration of 10 minutes or less
  - Interview duration observed during site visits were less than 10 minutes on average at most sites
- Interviews indicated limited availability of sufficient number of clinicians
- Clinicians concerned about being able to be effective in the time allotted to process each SM
  - Particularly with regard to establishing a meaningful rapport
  - SMs sometimes rushed through interview due to substantial time already spent waiting

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Coding Communication Patterns in Audiotaped Clinician Interviews

- PDHRA specific coding
  - Problem area mentioned?
  - Education provided?
  - Previous treatment queried?
- The Roter Interaction Analysis System (RIAS) is an internationally recognized instrument that has emerged as the most widely used system for coding communication in medical encounters
- Numerous sub-codes can be used to identify the nature of information given and received as well as the general tone of the medical encounter
- RIAS codes for
  - Task-focused exchanges: have to do with the interview process (e.g., asking questions about previous treatment or giving medical information)
  - Socio-emotional exchanges: more personal (e.g., laughing or making an empathic statement)

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PDHRA-specific communication about behavioral health issues different than physical health

- Less mention of behavioral health problem areas
  - Physical health mentioned regardless of SM endorsement (87% v 84%)
  - Behavioral topics mentioned more when SM endorsed (64%) than not endorsed (35%)
- Little provision of education
  - Education related to mental health issues in 14% of all calls
  - Increased to 24% in calls where a medical referral was given
- Prior treatment discussed less for behavioral health and exposure problems
  - Physical health or TBI problems (87% to 92%)
  - Alcohol, mental health, or exposure (3.1% to 63.6%)
- We do not know what these patterns look like for in-person interviews

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Clinicians do not use Empathy Statements

- 'Clinician empathy statements' (e.g., "This is distressing for you, I understand") occurred in only nine (3.3 %) calls
- The majority of RIAS variables, 18 of 35, occurred in less than 50% of calls. This illustrates that there was a great degree of variation in the types of communication clinicians used
- Further, variability in clinicians' communication patterns is mostly related to SM self-report characteristics

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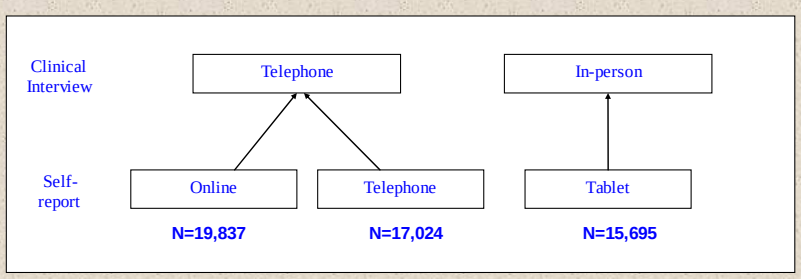
Comparison of PDHRA Results by Context: Telephone v. in-person Interviews

- Reserve component only
- A controlled study with random assignment would have been ideal, but no volunteer units could be recruited
- Analyses were conducted after creating equivalent groups of SMs using statistical methods due to differences in SM characteristics and PDHRA self-report



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Interview Context Matters

- **Documentation of major clinician concerns was similar**
- Clinician risk assessment for presence of TBI and alcohol problems
  - More likely to be documented as a potential problem during telephone interviews
  - Less likely to indicate referral during telephone interviews
  - Stronger positive correlation between risk assessment and indication of referral for in-person interviews
- Medical referrals more likely for PDHRAs with in-person interviews
  - Three times more likely to be given
  - SMs half as likely to decline any referral
- It is not clear that more referrals are better
  - Call center clinicians do many more screenings than in-person clinicians, and may be appropriately increasing specificity

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Screening for Alcohol Use may be Creating Too Many False Positives

- Additional questions and algorithm added to PDHRA 2008 version
  - Greatly increased number of positive screenings compared to previous versions (12% to 42%)
  - However, major clinician concerns and referrals for alcohol did not increase between versions
- In audio-recordings of PDHRA interviews, some clinicians pose alcohol questions differently
  - Downplay symptoms “So do you have an alcohol problem or is this just social drinking?”
  - Discomfort with scoring system “The military has a scoring system- a very harsh scoring system for how much they feel people should drink”
- Some behavioral health consultants interviewed by VU staff expressed concern that algorithm too sensitive

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Recommendations

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Recommendations: Implementable Now

- Establish quality assurance procedures for the clinician interview
- Establish clinician guidelines for a more structured and systematic PDHRA interview
- Encourage unit leadership involvement in and support of the PDHRA process
- Provide greater visibility and incentive for SMs to take advantage of education for post-deployment and reintegration issues
- Offer PDHRA-specific education targeted to informal supports (religious and spiritual leaders and SMs' families and friends) to increase awareness of the PDHRA as a helpful source of support
- Ensure greater confidentiality during the PDHRA process
- Add questions to the PDHRA regarding SMs' combat exposure (or make PDHA available)

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Actions that Have Already Been Taken by LHI

- In June 2009, revised the healthcare provider (HCP) QA review form to better check if HCPs are
  - Providing education
  - Asking questions about all types of potential problems (including exposure and behavioral health)
- Adding questions on the HCP QA review form to check if HCPs are:
  - Asking the behavioral risk questions verbatim
  - Asking about treatment for alcohol and behavioral health concerns
- Adding the following to the training of HCPs (both Call Center and traveling teams)
  - All of above
  - How to deal with the alcohol questions, especially for those with AUDIT scores at or slightly above the cut-off for potential problems so the HCPs don't alienate the Service member, yet don't minimize the potential problem
  - Increased normalization of behavioral health issues upon return from deployment
- Working with Call Center HCPs to reduce threshold for referrals and decrease declinations

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Recommendations: Implementation Requires Further Development

- Require all clinicians to have successfully completed PDHRA-specific training
- Provide clinicians with monitoring and feedback about their performance on the PDHRA
- Re-evaluate the PDHRA alcohol screening and training provided the clinicians on this topic

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Next Steps for Vanderbilt

- Two-year cooperative agreement with USAMRMC to develop and pilot PDHRA-specific clinician training
- Intend to use these results to inform activities with expert panel input
  - Identify and evaluate innovative PDHRA training programs for clinicians
  - Develop and implement a training and feedback system for PDHRA clinicians

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Questions Raised by Evaluation – Data Available

- Expand analysis of the SM survey to explore the relationship between the attitudes from survey and PDHRA SM self-report, clinician concerns and referrals
- Examine ICD-9 and CPT codes to see if HCEs after the PDHRA relate to the types of concerns and referrals documented on the PDHRA. This analysis is one way to understand if referrals from the PDHRA are appropriate
- A more comprehensive analysis could examine additional differences between the 2005 and 2008 versions of the PDHRA

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Additional Data Collection Required

- A randomized study to examine if context of the clinical interview influences SM disclosure of symptoms or acceptance of referrals. Are face-to-face interviews worth the cost?
- Conduct a randomized experiment with SMs randomly assigned to one of the following groups:
  - Clinician assessment only (the SM sees the clinician, but does not complete a PDHRA form)
  - Blind to self-report (the SM completes the self-report but the clinician does not see it)
  - Self-report and clinician assessment (the typical PDHRA process)
  - Control (PDHRA delayed by at least two months)
  - Comparison of clinician concerns and referrals, and SM health care encounters among these groups would help establish the role of the clinician in the PDHRA process.
- Determine if the services to which SMs are referred improve outcomes

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